AMERICAN Railroad Journal

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Steam Navigation, Commerce and Finance, Tramways, New Inventions, Machinery, Mining.

WHOLE No. 2,452.] NEW YORK, JULY, 1883. [VOLUME LVII.—No. 4.

WE invite railroad officers to send us notice of elections, transfers, appointments, resignations, etc.; and all our readers would oblige us by furnishing us with any items of news which may come to their knowledge and are of a suitable nature for our columns. It is our intention to publish monthly full and accurate information regarding those enterprises and industries to which the AMERICAN RAILROAD JOURNAL is devoted, and to effect this end we solicit the co-operation of readers interested therein. We aim specially to record all new railway enterprises in the United States and Canada, and to note the progress of construction on all new roads and extensions; and we request those concerned in railway building to give us early information concerning the above, that our reports may be as complete as possible.

ORGANIZATION.

THE Farmington and Carrabasett Railroad Co. was organized at New Portland, Me., on the 28th ult., by the election of the following board of directors: I. W. Green, Eustis; E. S. Winter, M. B. Potter, A. Knapp, Kingfield; A. Davis, L. Vaughan, J. Emery, New Portland; J. M. Burbank, Freeman; G. N. Clark, E. R. Luce, A. J. Sweet, New Vineyard. D. M. Bonney of Farmington was chosen president, and E. S. Winter of Kingfield, treasurer. The object of this organization is the construction of a railroad from Farmington via New Vineyard to Portland and Kingfield. The distance is 18 miles.

AT the annual meeting of the stockholders of the Shore Line Railroad Company, held in New Haven, Conn., on the 29th ult., the following gentlemen were chosen directors for the ensuing year: S. B. Chittenden and C. G. Langdon of New York; E. H. Trowbridge, W. F. Bartlett, H. L. Hotchkiss, W. F. Day and A. D. Osborne of New Haven. The directors chose S. B. Chittenden president, E. H. Trowbridge vice-president, and W. F. Day treasurer and transfer agent.

THE corporators under the new charter recently granted by the Massachusetts Legislature to the Cape Cod Ship Canal Co., met in Boston on the 5th inst. and elected the following board of directors: W. Seward, Jr., J. T. Holle, S. Fessenden, G. S. Hall, E. Reed, W. A. Clark, Jr., and J. Styles. Subsequently, the following officers were chosen: President, Wm. Seward, Jr., of New York; vice-president, J. P. Holle, of Boston; treasurer, S. Fessenden, of Sandwich.

THE directors of the Cincinnati and Eastern Railroad Company, elected on the 2d inst., are: W. R. McGill, O. H. Hardin, J. D. Ellison, H. Lewis, E. W. Woodward, P. E. Roach, L. D. Drake, J. H. Rhoades, F. N. Baldwin, A. H. Bughef, G. G. Roots, L. Glenn, W. A. Proctor, M. Jamieson and S. Peike. Subsequently, W. R. McGill was elected president and W. Mansfield, secretary.

THE stockholders of the Pennsylvania, Slatington and New England Railroad Company, at their recent annual meeting elected the following directors: G. M. Wright, E. G. R. Applegate, N. L. Rue, S. M. Schenck, G. W. Mackey, J. Loomis, F. M. Ward, J. F. Ward, J. W. Rutherford, C. V. Moore and J. Linn. J. F. Ward was elected president in place of N. L. Rue, resigned.

AT the annual meeting of the Philadelphia, Reading and Pottsville Telegraph Company, held in Reading, Penn., on the 3d inst., the following officers were elected for the ensuing year: President, F. B. Gowen; directors, J. B. Lippincott, H. Lewis, E. C. Knight, and G. A. Nicolls; secretary, H. Hancock; treasurer, J. Welch.

THE permanent organization of the Salina, Lincoln and Fremont Railroad Co. has been completed as follows: M. Dickenson, of Wahoo, president; S. C. Smith, Beatrice, first vice-president; O. P. Hamilton, Salina, Kan., second vice-president; N. C. Brock, Lincoln, treasurer; C. T. Boggs, Lincoln, secretary.

THE officers of the New York and Harlem Railroad Company, elected on the 22d ult., are: Wm. H. Vanderbilt, president; C. Vanderbilt, vice-president and secretary, and E. V. W. Rossiter, treasurer. This is the only road of which Wm. H. Vanderbilt is now president.

THE directors of the Winchester and Strasburg Railroad Company, elected on the 3d inst., are: T. Whitridge, H. Sisson, J. A. Sherrard, G. A. Hupp and J. Gregg. President, Robert Garrett; secretary and treasurer, Wm. H. Ijams.

THE Canada Southern Railway Company was organized on the 22d ult. by the election of C. Vanderbilt, president, C. F. Cox, vice-pres't, N. Kingsmill, secretary, and Allyn Cox, treasurer.

CONSTRUCTION.

THE Streets Run Branch of the Baltimore and Ohio Railroad, which was opened for freight business on the 2d inst., is the cut-off between Pittsburgh and Wheeling, and enables that company to compete with other roads in the shipment of freight from Pittsburgh to the West. Hitherto any freight for the West received in Pittsburgh had to be transferred 150 miles east to Cumberland and 200 miles west to Wheeling, but by the Streets Run Branch this distance is reduced to only 60 miles. At present only freight will be carried over the new route. After a month or two, passenger trains will also be run. The company propose to erect a new passenger station, and will, during the next year, build an iron bridge across the Monongahela River, to connect the Streets Run Branch with the main tracks. Until that work is finished, freight and passengers will be transferred by boat.

MOST of the contracts for the construction of the Philadelphia extension of the Baltimore and Ohio Railroad have been let. Wilcox & Driesbach, of Bradford, Pa., are stated to have secured a portion of the work at $1,500,000. The company in making the lettings to the several contractors, stipulated to have the line in running order in the winter of 1884-5.

THE new line between Chicago and Detroit, which was opened on the 8th inst., consists of the Wabash Railway from Detroit to Auburn Junction, 126 miles, and the Baltimore and Ohio from Auburn Junction to Chicago, 146 miles, making the distance from Detroit to Chicago 272 miles.

THE last rail completing the Kansas City and Memphis Railway between the St. Louis, Iron Mountain and Southern Railway crossing at Hoxie and Springfield, Mo., was laid on the 30th ult. It is expected that the 17 miles of track remaining to complete the road to Memphis will be finished by the 1st of September.

THE Fitchburg Railroad now has its second track in operation to Orange, 87 miles from Boston, and the rails are down to a point two miles east of Miller's Falls.

IT is stated that trains will be run over the Thomasville, Tallapoosa and Gulf Railroad, from Tallahassee to Thomasville, Florida, by January, 1884.

A LARGE number of hands are now employed on the Tampa end of the South Florida Railroad. The force will soon be increased to about 1,000.

THE length of the Louisiana and Arkansas Railroad has been increased from 60 to 120 miles.

PERSONAL.

THE various roads constituting the Wabash system have been rearranged and grouped into four divisions to be known as the Eastern, Middle, Northern and Western. They will be officered as follows: Eastern Division—G. W. Stevens, sup't, at Peru, Ind., with D. G. Moore at Cairo, Ill., and B. F. Matthias at Rantoul as assistants. Middle Division—H. F. Clark, sup't, at Springfield, Ill., with N. L. Tompkins at Forest, and F. D. Schermerhorn, of Quincy, as assistants. Northern Division—E. N. Armstrong, sup't, at Peoria, Ill., with E. B. Hyde at Havana, as assistant. Western Division—R. S. Miner, sup't, at Moberly, Mo., with E. Dresser at Stanberry, as assistant. In addition to these, the Des Moines and Northwestern Railroad, narrow-gauge, will be in charge of C. F. Meek, as assistant sup't. Robert Andrews will remain general superintendent of the system.

THE President has appointed Col. Samuel B. Holabird to be Quartermaster General to succeed Gen'l Rufus Ingalls, retired. He also appointed First Lieut. Charles Ingalls, Sixth Infantry, to be Captain and Assistant Quartermaster General.

THE officers of the Northern Pacific Terminal Company of Oregon, recently chosen, are: E. D. Adams, president; C. H. Prescott, vice-president; G. S. Jones, treasurer, and R. E. O'Brien, manager.

S. N. SCHANK, vice-pres't of the Pennsylvania, Slatington and New England Railroad, has been elected a director of the Highland Junction and Storm King Bridge Railroad Co.

W. W. HEAFFORD has been appointed Canadian Passenger Agent of the Chicago, Milwaukee and St. Paul Railway Co., with headquarters at Toronto.

F. A. STEVENS, of Boston, Mass., has been appointed State Railroad Commissioner in place of C. Herschel, whose term has expired.

T. GUCKER has been appointed sup't of the Philadelphia Division of the Pennsylvania Railroad, to take effect on the 1st of August.

R. CARROLL has been appointed Gen'l Sup't of the Cincinnati, New Orleans and Texas Pacific Railroad and all its branches.

H. M. KOCHERSPERGER, of Philadelphia, has been appointed auditor of the New York and New England Railroad Co.

ERASTUS YOUNG has been appointed auditor of the Union Pacific Railway Company.

The Late Chester W. Chapin.

SINCE the production of our last issue, a gentleman eminent in the development of the American railroad system has passed away, and it is proper that we should devote space in this number, to a short sketch of his career.

The late Chester W. Chapin, ex-president of the Boston and Albany Railroad, died at Springfield, Massachusetts, on the tenth day of June, 1883. His long and useful life was ended by a stroke of paralysis.

Mr. Chapin was born at Ludlow, Mass., December 16, 1798, the son of a farmer, who, while he was a boy, made him useful on the farm during the summer, but took care that he attended the district school in winter. When the time came for the young man to leave home, he began a business life, which proved very congenial to his tastes; and when about twenty-nine years of age, he had accumulated the means of becoming a proprietor in the stage line between Hartford and Brattleboro. This was in 1827, from which time until about three years later, the firm of Sargent & Chapin provided the service indicated. In 1831 Mr. Chapin bought two steamers plying on the Connecticut River. He owned and run these until 1844, when the opening of the railroad between Hartford and Springfield rendered the continuance of the service unnecessary. During several years previous to this time, he had interested himself in railroad matters, and was made a director of the Hartford and Springfield Railroad, three years before its completion in 1844. In 1846 he was elected a director of the Connecticut River Railroad Company, and in the same year or about that time, contracted to carry the mails between St. Louis and Terre Haute, Indiana. From 1846 to 1872, Mr. Chapin acted as director of the Agawam Bank, which he founded in the first-named of these years, and of which he was for some time president. In 1850 he became a director of the Western Railroad, and was president of the Connecticut River Railroad from 1850 to 1854. Upon his election as president of the Western Railroad, in 1854, he devoted his energies to the building up of the line between Boston and Albany. Its roadway and rolling-stock underwent prompt improvement, and a year after his incumbency as president began, he had negotiated in England a loan of half a million dollars, with which he completed a double track between Springfield and Albany. The Boston and Albany Railroad, first known by this name in 1867, was formed by the consolidation of the Western and the Boston and Worcester railroads, a step mainly due to Mr. Chapin's enterprising policy. In 1872 Mr. Chapin became president of the Chapin Banking and Trust Company. He resigned his presidency of the Boston and Albany Railroad in 1878, but was numbered among its directors at the time of his death. His wealth was invested largely in railroad and steamboat enterprises, with a sagacity which seldom or never failed. Mr. Chapin served the community among whom he lived, in several public positions, including membership in the constitutional convention of 1853, and in the Forty-fourth Congress. He was a Democrat in politics. His charities were exemplary. Among the more remarkable of these, was his endowment of the presidency of Amherst College with bonds and stocks to the value of five thousand dollars. Chester W. Chapin, son of the deceased railroad magnate, is president of the New York and New Haven Steamboat Co.

THE general passenger agents of the Western lines have agreed upon the following charges for excess baggage, which are reductions from previous rates: Fifteen cents per hundred pounds, for any distance between one and thirty miles; twenty-five cents per hundred pounds, for distances between thirty-one and fifty miles, no charges to be less than twenty-five cents. Baggage going more than fifty miles will be charged according to the old agreement. The old tariff rate was twenty-five cents for distances less than fifty miles, the change having been made with reference to small distances.

Correspondence.

COMMUNICATIONS are solicited for this department on all subjects pertaining to Railroads, Steam Navigation, Machinery, Manufactures, etc. No attention will be paid to communications unless the name and address of the writer is furnished us, though if desired, they will be withheld from publication. We assume no responsibility for statements made by correspondents, and we do not necessarily endorse ideas advanced by them. Under these conditions we think it of value to our readers to devote a liberal space to the free discussion by others—whose opinions may be at variance with our own—of subjects pertinent to this department of the AMERICAN RAILROAD JOURNAL.]

OFFICE OF CANADA ATLANTIC RAILWAY,
OTTAWA, June 23, 1883.

Editor American Railroad Journal:

SIR:—I notice in June number of the JOURNAL, inquiries concerning the engine that on the 17th day of May last, hauled from Alexandria to Coteau—upon which portion we found the hardest grade of this road—a train of forty cars of freight, the gross weight of which was 792 tons. The distance was twenty-three miles and the time occupied was, including stop of eight minutes at Glen Robertson, and eight minutes crossing express train at St. Polycarpe, one hour and twenty-five minutes. The engine is called the Mansfield, and was built at the Mason Machine Works, Taunton, Mass., in 1876. It is, I think, called by them a truck engine, and is a modification of the Fairlie type. Cylinders are 16x24, has six coupled driver four feet diameter. Heating surface of fire-box is: Length, 5 feet 6 inches; depth, 5 feet 6 inches; width, 4 feet. Number tubes 162, two inch by twelve feet eight inches in length. This large heating surface will explain to your correspondent how the engine was able to keep up such a rapid expenditure of steam, for so long a time. The boiler pressure was maintained at 130° throughout the trip.

Your correspondent can obtain a more full description of the engine by addressing the makers, and I presume can also obtain a photograph of the engine, should he desire it, of the same parties.

M. DONALDSON.
Canada Atlantic Railway.

The Two First American Locomotives.

MR. DANIEL MATHEW, who lives at No. 1161 Howard street, San Francisco, has sent the publishers a letter, from Chicago, dated June 19, 1883. The old gentleman writes with vim, and in a hand remarkable for its steadiness and legibility. This is what he says:—

"Gentlemen, I take the liberty of dropping you this note and my card of the two first locomotive engines built in the United States, and the two first to draw trains of cars in the United States; built by the West Point Foundry Shops, in the City of New York in 1830, and were exhibited under steam at the shops foot of Beach street when finished, before shipping them to the Charleston and Harrisburgh Railway in South Carolina.

"The papers of the day published the trials for the information of those taking an interest in the then infant project in this country. I was the one to exhibit and handle the engines, as shown in the card. I was the engineer that run the first train over the M. and H. R. R. from Albany to Schenectady in 1831, and was a subscriber to the RAILROAD JOURNAL in 1831, from Schenectady, N. Y., where I hailed from for many years."

An Early Projector of the Brooklyn Bridge.

NEW YORK, July 2, 1883.

Editor American Railroad Journal:—

SIR: Having noticed some recent articles in the newspapers, touching the Brooklyn Bridge and its early projectors and advocates—none of which recent articles appear to go back far enough to reach and call to remembrance some of the first and really earnest published endeavors in respect to the Bridge—I therefore have turned to some instances of nearly fifty years ago (1834) which I had noticed in my former readings on the subject of bridges and railroads, of which the most important is an article of some length in your JOURNAL, Vol. 4, No. 1, page 4, of Jan. 10th, 1835, signed by W. Lake, Civil Engineer and Architect, No. 23 Nassau street, New York, and dated in December, 1834, in which he dwells upon the propriety, practicability and future needs of a bridge which could be built in the vicinity of Fulton Ferry, and says that plans thereof can be seen at his office, No. 23 Nassau street; but admits that some improvements might be made by consultation with skillful engineers. He also suggests that the bridge could be made considerably higher by extending the approaches one thousand (1,000) feet on each end. His plan as set forth therein, is of a "suspension" bridge with one *center* pier; for the foundation of which he gives the soundings as taken from Blunt's chart of the East River, and says that such a foundation could be well and substantially built by the use of a coffer-dam. This is the earliest *practical* reference to the present bridge, its plan and location, that I find among any of my notes. Subsequently, in No. 45, of Nov. 14, 1835, page 381, of same volume of your JOURNAL, is another article on the subject of a Brooklyn Bridge, and referring to Mr. Lake's plan of a "suspension" bridge. At that early day street railroads attracted so little attention that no provision was made for one by Mr. Lake. He simply provided for two center foot-ways, and two outside carriage-ways. With the exception of a center pier in the river, the plan did not differ materially from the present bridge, further than that the intellect and experience of subsequent workers have evolved improvement, conforming to the progress of time, in size, cost and capacity of the work.

Respectfully, G. B.

AS AN instance of the business lately done in trade dollars, a prominent Philadelphia banker says that a broker bought in New York, 10,000 trade dollars for $9,000, and sold them for $9,500. The manufacturers, of course, paid them out to their hands. A not inconsiderable profit at the expense of the operatives. The officers of the Mint say they have been instructed not to receive trade dollars except as bullion. At the Mint, silver in lots of less than 10,000 ounces, is bought at ninety-nine cents per ounce. If the Mint bought 10,000 trade dollars for $10,000, it would lose by the transaction, $133.75. The trade dollar weighs 420 grains, or seven-eighths of an ounce. One thousand trade dollars weigh, therefore, 875 ounces. As an ounce of silver is worth 99 cents, 875 ounces (or 1,000 trade dollars) are worth only $866,25, or $133.75 less than $1,000. This, therefore, regulates the market value of the trade dollar and makes it worth seven-eighths of ninety-nine cents, or 86.625 cents.

THE increasing demand for hurried work, especially in railroad paint shops, is causing some complaint, not only among the painters, who find it difficult to produce the best work in the limited time allowed them, but also among the manufacturers, who are put to considerable trouble in endeavoring to satisfy the joint demands of durability and speed. Painters have before expressed their grievances over this matter in our columns, and there seems to be no doubt that it is often impossible for them to do themselves and their work justice, under the restrictions with which they are hampered. And it is not a wise economy to gain a few days' time at the sacrifice of durability and appearance, which must inevitably follow an undue hastening of the painting process. It should be remembered that when the drying property of a varnish is hastened it must have less durability; and in a class of work where this quality is so important as it is in the painting of railroad cars, it becomes a serious question whether the time gained in hurrying the car out of the paint shop, is not more than lost by its consequent early return for repainting.—*Coach Painter.*

IT is expected that the journey from Paris to Constantinople will soon be made in seventy-five hours. A through train with forty-two beds now runs twice a week.

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ADVERTISERS and subscribers are respectfully cautioned against making payments to any person professing to represent this journal, excepting he is able to show a written order from this office, duly signed by the president or secretary.

ALL copy for publication in the AMERICAN RAILROAD JOURNAL, both advertisements and articles, should be mailed to reach the publishers not later than the end of the month previous to that in which it is expected to appear. For example, copy for the August number should be mailed to reach us by the thirty-first of July, at the latest. There is no fear of being too early in sending, and our correspondents would oblige us by anticipating, as far as possible, the last day on which we can receive copy.

NEW YORK, JULY, 1883.

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Sunday Trains.

THE following article from the *Boston Post* of June 5th, brings to public attention an old subject.

STANDING ON THE TRACK.

For the first time in its history the Housatonic Railroad Company, an enterprising corporation, has been running for several weeks Sunday trains its whole length, from Bridgeport to Pittsfield, accommodating a great deal of legitimate travel, bringing the Sunday papers from New York, performing a great many other kindly offices that were well appreciated by the public. But somehow the service, while tending to invite the favor of the road's patrons generally, did not appeal to the good opinion of the clergy in a number of rural towns through which the trains passed. They made an united and earnest protest against the innovation. They remonstrated and they condemned. They presented petitions to the company, but as they were not regarded as forming the controlling part of that public which well managed corporations acknowledge as master, the Sunday trains continued to run as usual. The town authorities of Berkshire, or some part of it touched by the offending train, therefore did assemble in their majesty last Sunday, and with the warrant of some remnant of an ancient blue law, turn back the wheels of progress, or, rather, prevent them from rolling beyond the Connecticut line, North Canaan being the last town to be visited. We have not as yet been favored with a detailed report of the full measure of the company's offending, but we cannot understand, upon the face of this proceeding, why the Sunday passenger train north should not be allowed to run to the end of its route as well as the Sunday milk train south. Human freight, hardly less than lacteal freight, gets very much soured by having to wait till Monday for transportation that might, except for certain fast-fading prejudices, be just as well supplied Sunday. When Sunday transportation is furnished, it never fails to accommodate those who travel as much on account of necessity as do those who ride in a dirty car behind a milk freight, and stop five minutes at each station for additional supplies. Perhaps the Sunday train was too rapid, and did not proceed with that hearse-like solemnity characteristic of a "mixed" accommodation. There are a great many inferences that may be drawn, but the Berkshire clergy have the key to the situation, and they have not to our knowledge taken any but their congregations into the secret. The clergy teaches that life is but a span, that we are here to-day and in the hereafter to-morrow, and yet they would shut mankind off from one-seventh of the opportunities to make the most of its fleeting existence. Had the trains been running, probably Irving would not have written his "Wet Sunday in a Country Inn," and while we should regret to give up the sketch, there are tens of thousands who would gladly forego the experience. The Berkshire clergy must know that their victory is but temporary. Sunday trains are going to come, and come to stay, wherever there are railroads for them to run on; and we would advise the clergy to "look out for the engine when the bell rings."

The running of Sunday trains has given many good persons anxious thought. The most strenuous advocates for them cannot urge that they are an unmixed good. On the other hand, the most bitter opponents cannot claim that they are an unmixed evil. We can understand why the "old Puritans," as they are called, do not endorse the running of trains through their quiet villages on Sunday, as they have been brought up to regard the day holy unto the Lord, and have no use for such trains. Many of them have never seen beyond their own potato hills, and have no desire to see further. There is no question but that such oppose these trains actuated, as they believe, by a good conscience. They take refuge behind conscience. So did Paul when he persecuted the Christians, he verily believing that he was doing God a great service. These men pride themselves upon their honesty because they have the approval of conscience. It may be well for such to know that conscience as understood by us is not always a safe guide unless illuminated by a divine light from on high. Paul found this to be the case, for after the light above the brightness of the sun shone upon him while he was traveling the road to Damascus, he turned from trying to do God a service in persecuting the Christians, and became one of the hated, despised Christians himself. Circumstances alter cases. A very good deacon of a very good church in the State of Massachusetts was bitterly opposed to the running of horse-cars on Sunday. He belonged to a church that was forced to fill the aisles with camp-stools during the Sunday services, so popular was the minister; and the church being located so near the business circle, many families were obliged to use the horse-cars in order to reach it. He lived so near it was no trouble for him to walk. Such was his opinion of what constituted sanctity that he verily

believed he was holier than the patrons of the tramway. The time came, however, when he experienced a change of belief in this respect. He got mad with the minister. He couldn't sit under his preaching any longer, so he took a letter to another church, nearer somebody else's house than his own. It was a long distance for the old man who had lived all his life under the eaves of the sanctuary, and the task to walk it was too great. The question to be decided was whether he would forgive the minister and remain in his old church home, or sacrifice his principles and patronize the horse-cars. He settled the matter by patronizing the horse-cars. Now many of these opponents of Sunday trains, claiming to be honest, are in the same position of the good old deacon. They can get mad with the minister, and use the old farm horse to drive to some other church. They can meet in the horse sheds between services and trade horses, sell calves and shoats, buy crops, loan money, retail gossip, and do many things that the patron of the Sunday train would be ashamed to do. Yet this man, for conscience sake, can stop the train from entering Berkshire on Sunday, and subject many to inconvenience and some to loss.

We hope that we have a due regard for Sunday, and the feelings of others, but we must confess that as the world moves to-day we look upon the running of some trains on Sunday as a necessity, and an act of mercy. We do not make this claim for persons living in the country, as we are of the opinion that they can get along just as well without Sunday trains as with them, and for this reason we are not so anxious to slur them for their opposition. At the same time, we think it would be well for them to know that they are not the only people in the world, and that others have rights just as sacred as theirs. At this season of the year, when milk will not keep sweet two days, it is generally conceded, except by a few very bigoted farmers, that a Sunday milk train is a necessity. There was a time when the Sunday milk train was bitterly opposed, and the argument that thousands of infants in our cities were fed from the bottle, had no effect on these opponents. At last, however, humanitarian feelings triumphed over bigotry, and to-day thousands of infants receive the same sweet nourishment on Sundays as on other days.

The Sunday passenger train has not become so established a fact, as there are still some railroads which do not run trains on Sunday, and there are some communities that try to prevent their running. But let us calmly consider this subject. The country towns feel that they do not need these Sunday trains. But what of the cities?

In our large cities families are hived together, subjected to the heat of the sun from above and the pavements from beneath, and the thousands of fires necessary for household purposes; which add considerably to the heat received from the sun. The family does not experience any difficulty from the foregoing in the winter months, but when summer comes, suffering is their portion. The husband and father goes home at night to find a wife almost prostrated, and children sickly and feverish. He finds a place in the country to which he sends them for pure wholesome food and fresh air. He himself is obliged to remain behind in the city to keep the wheels of business rolling, so that he can earn the money to pay the country people for taking care of his family. Sunday is the only day on which he can visit those who are nearest and dearest to him. Is he to be debarred the privilege of seeing them one day in seven, when he is making so great a sacrifice for their health and comfort? But if there are no Sunday trains he is debarred—what then? He cannot do business on Sunday, and the day becomes to him so lonesome that unless he is a remarkably strong man, he will seek company and recreation in some other way. In a large city these ways are always open, and the best are none too good. A man accustomed to the companionship of wife and daughters, when cut off from them is apt to seek the companionship of other women. There are times and seasons when this is not dangerous, and there are times and seasons when it may be dangerous. Or the man may have such a strict sense of honor as to avoid the above pitfall, and associate himself with men instead. Here he may be safe, but it is so easy to play a game for a little money to add to the excitement, to take a little too much drink, to engage in some questionable pleasure, that he may in time be wrecked. Then there is danger that the wife, away from household cares, may find time hanging heavily on her hands; may make companionships that shall not prove of ultimate good to her peace of mind. In the name of humanity, of law and order, of good morals, of the sanctity of the family, yea of religion itself, the running of Sunday passenger trains can be urged. There is another reason why there should be direct communication between the cities and country towns during the summer months on Sundays, and that is that business men recreating in the country can receive the Sunday papers. There was a time when Sunday papers were not a necessity, but that time is not now. As business is conducted to-day, it becomes every man's duty to keep daily track of movements as they take place throughout the country. A fire Saturday night in some distant city may make a great difference in a man's affairs if known Sunday instead of Monday. When the great fire swept Boston that memorable Saturday night, many men went to the city on Monday morning to find their places of business in ashes and themselves bankrupt. Some of these men if notified on Sunday morning instead of Monday, could have saved something, for many of those who were notified by the telegraph did. A cyclone may destroy crops in some western district—a freshet may delay many trains on as many different railroads—sleet may impair the usefulness of the telegraph—numberless disturbances may occur—earliest possible knowledge of which is essential to the business man. Until men can control the so-called providences of God, or the unaccountable workings of Nature, or the accidents of men, or the knavery of rascals, they must be on the alert every day in the week, Sundays included. There is no law that can work with equal force and justice on all men alike, as different conditions and circumstances call for different lines of action.

There is no excuse in a country town for men to keep their places of business open on any part of the Sabbath day, but there is excuse for such in a city like New York. In a country town the six working days are sufficient to enable all the inhabitants to perform their labors, and provide for their Sunday living. In New York, however, this cannot be done. Thousands of men in this great city work nights. Their pay is so small that it is barely sufficient to provide for one day's living at a time. The money earned Friday night is spent on Saturday for Saturday's living. The money earned Saturday night must be spent on Sunday for Sunday's living, or they must go without. A Sunday law closing up all places of business in a community where this necessity does not prevail, is a blessing and in the right direction. But to make such a law binding on those whose necessities are such as to make the buying of food on the Sunday essential, is to join the company of Pharisees who condemned the disciples of Christ for plucking the corn on the Sabbath to satisfy their hunger. There is no such thing as finally blocking the wheels of progress in any direction; and the running of Sunday trains cannot be condemned when in the interests of humanity, necessity or mercy. The Sabbath was made for man, not man for the Sabbath. We now reach a point where the employés of railroads demand consideration at our hands. We understand that the tramways pay their employés so much a day of so many hours, and pay them only for the days they work. As the tramways run every day in the week the employés work every day and therefore have no Sunday. This is claimed to be a great hardship to the conductors and drivers on the cars. In a certain sense this is the case, but if so disposed could not these employés arrange to have one day in seven if they chose? If we understand it, the reason they do not have it is that they are anxious to make the wages paid for that day. The plea is that $1.75 to $2.00 a day is such small compensation for the number

of hours they work, that they are obliged to work Sundays in order to make a full week's pay. The argument is not good, for if the tramways did not run their cars on Sunday they would not pay the wages for that day; and the employés would be obliged to take six days' pay and be idle the seventh day, which they can arrange to do now if they choose to take six days' pay instead of seven. The fact is, that they value the day's pay more than the day.

Now the running of Sunday trains on our steam railways necessitates the using of men who have already worked six days, and are entitled to the seventh as their own. We make the above statement as a supposable case, for the sake of giving the opponents of Sunday trains every advantage; when in fact we know that some railways give their employés engaged on long travel, every third or fourth day off. Employés on local or way trains may not be served as well, but the strain on them is not so great, as time for rest or recreation is found for them at different times during the day. But allow that the running of Sunday trains imposes on the train hands all the hardships chimed, we ask cannot these hardships be alleviated without stopping the trains? Every sensible railway superintendent can answer this question in the affirmative. Train men can be so detailed that the one set running on Sunday of one week can have the Sunday of the following week. They can also have the one day in seven when they have been on duty on a Sunday by being allowed some other day to take its place. The man who truly wishes to set apart one day as holy unto the Lord can do so as well on one day as on another.

The question of hardship to any class of men is one that we desire to handle tenderly, as we believe it to be a duty to lift all burdens, and have men as free as possible; but in lifting burdens from one set of men we must be careful that by so doing we are not placing heavier burdens on another set. The sailor goes forth to do business on the mighty deep, and sometimes is absent from his loved ones for years. He cannot stop his steamship or vessel in mid-ocean when Sunday comes. If he wishes to keep the Sabbath, he must do so on shipboard under such circumstances as surround him. If it is a calm he can sit around, read his Bible and pray. If it is a stormy day, he must man the ropes instead. But whether the day is calm or stormy, if he is a religious man he is as near God in one case as the other. Now there is no railroad man who will claim that his hardship is as great as the sailor's. The truth of the whole matter is this, that in the question of hardship, every man is liable to think his own burden greater than his neighbor's, and yet when acquainted with his neighbor's he has no desire to exchange.

We must try to help each other in the bearing of our burdens, not by transferring them from one set of shoulders to another, but by making a more equal division of labor. While Sunday trains are a necessity and will be run, train hands, so far as they wish it, can be given one day in seven. If they prefer to earn the money for this seventh day instead of taking the day itself, there is no need of philanthropists espousing their cause by decrying the running of Sunday trains.

In the case of the railway companies as corporations, some legislation may be necessary to guide them in the running of these Sunday trains, and yet we do not now see how such legislation can avail much. As we review the situation, we judge it to be better to let public opinion bear upon each road, and demand the running of such trains as are necessary, and the suppression of such trains as are unnecessary.

Railways running from large cities to neighboring health or pleasure resorts, are obliged to run trains more frequently to accommodate the great multitude, to whom Sunday is the only day of recreation, than is necessary on railways running from cities to country homes. The latter may succeed in accomplishing the end desired by running one train each way on a Sunday, while the former can only accomplish the end by running as many trains as the travel demands.

We have tried to present this subject to our readers in the most kindly spirit, intending to deal fairly with both sides, and now ask in conclusion that the defendants and opponents of Sunday trains bear as kindly with each other, remembering that each party has rights the other is bound to respect.

THE RAILWAY EXPOSITION.

WE publish in another column some excerpts from Journals regarding this Exposition. Our readers will have noticed that while we have been careful not to condemn the Exposition in the past, we have avoided the giving of undue praise. The ground occupied by us was taken, not from any lack of faith in the honesty of the managers, but from a fear that the Exposition might assume too great proportions for the simple business management advertised in the beginning. From what we learn from our special correspondent on the field, we conclude that we were right in our surmise. The Exposition had hardly closed the doors before the cry of fraud was heard. Some claimed that the whole thing was gotten up as an advertising dodge of a rival Railway Journal. But suppose it was, what then? If the President and Editor of the *Railway Age*, or any other paper, is smart enough to engineer a grand affair like the Railway Exposition successfully, he deserves great credit for his enterprise and ability, and ought to receive liberal compensation. If he looks for his compensation in a more extended patronage to his paper, we sincerely hope he will not be disappointed. We understand that the Exposition itself will show a deficit of about ten thousand dollars, which we trust will be promptly made up, so that those who have done the work will not suffer loss. But there is another charge of fraud, and that is that the Awards and Medals were not awarded according to the merit of the articles exhibited. We are afraid that the accusers are a little too hasty in making such a charge. In the printed rules and regulations governing the Exposition, we find the following:

RULE VI.

Section 1. Committees of awards, or juries, for the several classes, will be announced to exhibitors in due time, the desire of the Commissioners being to organize them with great care, from persons entirely disinterested, and yet qualified by education and experience to serve intelligently and satisfactorily. Exhibitors or their representatives in attendance will be notified of the date of examination of their exhibits in advance of such examination.

Section 2. The jury for each class will consist of three persons, and awards will be based upon examinations and tests in the most thorough possible manner.

Section 3. *Juries will award medals only to the most meritorious exhibits in each class*, and where but one exhibit is entered in any class, no award will be made, unless in the unanimous opinion of the jury, approved by the commissioners, it is worthy of award, notwithstanding the absence of competing exhibits, and they may refuse to award a prize in any case where the article falls below a proper and reasonable standard of excellence.

The careful reader will notice that Section 3 of Rule VI., expressly states that "Juries will award medals ONLY TO THE MOST MERITORIOUS EXHIBITS in each class. The framer of that section may have had in mind that he and his associates did not care to bear the whole expense of the Exposition, and the best way to avoid this was, to make it an object for an exhibitor to take as much space as he could. There was one way to do this, and that was to award a medal to the most meritorious exhibit. The exhibitor having money and not the best article to exhibit,

could fit up a booth at great expense, and outshine his poorer competitor even though he had a better article. He would get the medal for his exhibit, and the majority of people on this account would think his article the best when, in fact, it was inferior to his poorer neighbor's. Now there are many manufacturers who would gladly take advantage of such a rule and spend large sums of money on their exhibit, and in getting the medal would consider themselves well repaid for their outlay. The managers making such a rule would be glad of such an exhibit, for the more attractive the exhibits, the greater drawing power the Exposition has for the crowd.

Now so far as this goes there is no fraud as between the manager and the exhibitors. The fraud, if any, is between them both and the public. No manufacturer was obliged to enter his goods, and if he did enter them, he was not obliged to compete for a medal. We are surprised that so many manufacturers claiming to be high-toned, entered into competition for a medal under such a rule.

Another charge of fraud is, that the medals in the different classes were awarded from favoritism and not according to rule. This is an old stereotyped charge made at the final of all such Expositions, and as we can never get at the right and wrong of it, we do not propose to waste time discussing it.

There is still one other charge of fraud and that is that in some cases the medals were not awarded. This result is claimed to have been forced on the managers by the action of exhibitors before the Jury appointed to decide on the merit of exhibits. Now there can be no question but that one exhibit was better than the rest, and that that exhibit earned the medal. Why is not the medal awarded? If one party fits up a booth at an expense of $10,000, another at $8,000, another at $6,000, another at $4,000, it is a very easy matter to decide that the $10,000 booth is the best exhibit and entitled to the medal. But if the $4,000 booth has the best goods, such a decision is a palpable fraud on the public. Then why not award the medal to the $4,000 booth because of superior goods? This cannot be done, as such a decision would be a fraud on the $10,000 booth. What can then be done? Simply what has been done, award no medal at all, and this is fraud. We have written the above not in any condemnatory spirit, but with the desire to put future managers on their guard.

THE TRADE DOLLAR.

SOME years ago, the government of the United States issued a coin which is known as the trade dollar. We have always understood that its intrinsic value was greater than that of the dollar of our fathers, and that it was made of such a value so as to be used for trading purposes with China.

To-day there is quite an excitement in New York, and perhaps elsewhere, regarding this trade dollar, and many are refusing to accept the coin except at a depreciation of fifteen per cent. The dollar of our fathers, which has been acknowledged to be of less value as bullion, is readily taken for its face value of one hundred cents. This difference between the two coins in the minds of the people is occasioned by a very small thing, the fact that the United States government has declared one to be legal tender and the other not. This action of the government in declaring the trade dollar to be not a legal tender, virtually makes millions of dollars of money in the United States absolutely useless for all business purposes. From a business standpoint, the United States government has been guilty of issuing and circulating millions of dollars of silver coin, which is worthless only as a party is willing to stand the shrinkage and have the same melted into bullion. All of these trade dollars came out of the United States Treasury, but not one of them can go back again, as the treasury will not accept it.

The face of each one of these trade dollars bears the imprint of the United States government that issued it, and yet at any post office of this government you cannot use one to buy a postage stamp with. It is a well-known fact among those who have been obliged to accept trade dollars, that for a long time back they have been unable to deposit them at the Banks or use them on railroads or steamboats. The only apparent use they have subserved is to enable skin-flint employers to buy them at eighty-six cents each and pay them to their employés for services rendered at 100 cents apiece. The employés have managed to pass them in payment for the necessaries of life, and if the storekeepers have not charged enough profit to protect them against loss, it is because they expected to pass them to any customer who needed change for a five-dollar bill. To-day, so far as New York is concerned, the bubble has burst. Hereafter, trade dollars will not be accepted by leading dealers, and all employés as well as their employers, must protect themselves by rejecting the worthless coin. We now hope that the United States government will take some action toward redeeming the coin that bears her imprint.

THE statement is made that W. J. MURPHY, Superintendent of the Delaware division of the New York, Lake Erie and Western Railroad, has issued an order prohibiting his men from taking alcoholic liquors, either while on or off duty. This is going a step beyond the prohibition of their use of such drinks while engaged in the performance of their work. There can be no question that if Mr. MURPHY's prohibition be obeyed in good faith, the safety of passengers traveling on his division will be promoted.

WE notice with pleasure that the public press continues to discuss the subject of a better future for American boys, whose opportunities of learning useful trades are unhappily very imperfect. The Chicago *Tribune*, in making out a good case for industrial education, has this to say as to its effects in the direction of providing means for native-born boys to acquire a knowledge of mechanical handicrafts: "If anything would excuse a sordid and determined banding together of Americans to crush out this foreign labor Know-Nothingism, it would be this monstrous injustice practiced upon American boys. Every boy who desires to learn a trade has the right to learn it, and no contingency or emergency of trades unionism can suggest even the shadow of an apology for preventing him. The manual training school, which will thoroughly equip every boy who goes to it with the knowledge of the trade he wishes to learn, is the agency which is bound to defeat the selfish and unjust schemes of trades unionism to monopolize labor, and keep it in its hands by keep-

ing American boys out of it. The faster these schools are multiplied the stronger will be their blows at this foreign conspiracy."

MR. BURNHAM, of Philadelphia, started a library fund, the product of which is a well-selected stock of books, used by the employés of the Denver and Rio Grande shops, located at Burnham, and a handsome balance in the treasury of the library association. We mention these interesting particulars in the hope that they will provoke men with the necessary means and influence to imitate Mr. BURNHAM'S example. The leaders in railroad enterprise could hardly do themselves and the public a better service than by encouraging the many men in their employment to spend their hours of recreation in useful reading; and the advantage to the employés would certainly prove incalculable. Many a good fellow wastes his time in reckless dissipation, from the sheer absence of inducements to the profitable use of his leisure. The provision of these would prove the beginning of advancement to young men who possess the natural capacity for great usefulness, but who, at present, are denied opportunities of improvement by their superiors in station and fortune.

ONE of the most interesting of the international exhibitions of this year, is that of Venezuela, which will be opened at Caracas, the capital of that country, on the twenty-fourth instant. This date will be the hundredth anniversary of the birth of SIMON BOLIVAR, who was born in Caracas, which city will give itself up to patriotic gayeties on the date named. Not only will the doors of the exposition be thrown open to the public on that day, but a statue of GEORGE WASHINGTON will be then unveiled, and what is still more interesting to the readers of this JOURNAL, a railroad running between Caracas and La Guayra, its port, will be put in operation. Our kindest wishes attend the events announced.

RAILROAD BUILDERS AS PUBLIC BENEFACTORS.

IT is a suggestive commentary upon the little wisdom with which mankind is governed, even in a free republic, to note that the railroad corporations, and indeed every other private association for conducting internal improvements and transportation, are regarded by the political power as things to be watched, guarded and restrained as if they were enemies of the public weal. There can be no doubt but that at the bottom this feeling originates in a form of jealousy. The political organization is not of that compact homogeneous character, nor is it bound together by such ties of fidelity or zeal as are religious, philanthropic, or purely commercial bodies. The element of patriotism forms but a small proportion, while the element of self-seeking vanity and grasping avarice forms a large part. The public service is not conducted with the same diligence, economy and efficiency which characterize any other considerable branch of industry. One moving principle animates all political parties—the cohesive power of the hope of public plunder. Self-seeking is indeed at the bottom of commerce, of ecclesiastical and professional ambition; but it is also true that while railroad builders and managers combine to increase their accumulations, or to make safer their possessions, they cannot do this without at the same time greatly benefiting the public. No other organization short of that which we call the nation, has contributed or can contribute to the whole people anything like the amount of benefit conferred by the steam transportation of the present age. Had the law remained in this country as it has in some semi-civilized countries, so as not to favor associated effort, transportation must have been carried on by individuals, or by the government. Had the railroads been undertaken by the government, it is safe to say no such extent would have been built to-day, and the cost would have been many times that which has been incurred. Take, as an illustration, the original Pacific Railroad. Notwithstanding the reckless haste and extravagant expenditure encouraged by the race of the two companies across the continent to a meeting point seven years sooner than the specified time, it is still cheaper than the government could have done the same work. It may be doubted whether the road between the Missouri River and the Pacific Ocean would have been completed to-day, had it been conducted by public officers; and there is no doubt that the cost would have been more than double.

On the other hand, observe the intolerable slowness of improvements to the rivers and harbors. When an imperative necessity arises, like that at the mouth of the Mississippi River, even now it becomes necessary to let the work out by contract to private individuals, and the work is soon done. There are half a dozen harbors of great importance, Mobile, Sabine, Galveston, Portland, San Pedro and Fransas, which could be cleaned out in much the same way if Congress could be persuaded to make them the subject of private contract. Yet the political power, from motives which must be guessed, prefers to hold these great improvements back, rather than exhibit its own inefficiency in such matters. Had it been possible to let out the contract for the suppression of the rebellion, no one doubts that it would have been finished up much sooner and at much less cost. But because sovereign power must of necessity be lodged with the political organization by which the nationality is embodied, it does not therefore follow that it should undertake other functions for which it has neither the adaptation nor the inspiring impulse. The authority of the government over its members may, and for some purposes must, be absolute; but that is no reason why it should undertake to exercise absolute authority in matters which are not strictly governmental functions.

The fashion of our day is for every State to create a railroad commission, for the avowed purpose of exercising some supervision or regulation over the railroads and their business. The sole ground for this interference is because railroad companies are managed and worked by corporations and not by individuals. In other words, political power shows an unworthy jealousy of the efficiency and beneficence of private effort; and in order to magnify its own importance it is necessary to make out that the people are suffering from some grievance, which nothing less than the interposition of the sovereign power can remove. These commissions have various powers and attributes; some of them, like those in Massachusetts and Ohio as examples, being little more than compiling and reporting bodies; others, like

commissions in Georgia, Tennessee and California, have been invested with the authority to prescribe rates of fare and freight, and the issue remains to be decided whether such an interference with so delicate a matter as transportation will be carried to its logical extreme. In the ever-shifting platforms of political parties, there will always be the demagogue who will seek to convince the mass of voters that they are oppressed and abused, who is ever willing to be the communistic agitator to persuade the people that their condition can be improved by a statute, and that by his help they may be made to exchange places with their rich neighbors. Such an effort is now made to embody in the platforms of both the great parties of this country, planks aimed at railroad corporations; and to do this it is necessary to falsify and circulate falsehoods on the whole subject of transportation, in the hope of convincing the working people that somehow their earnings are disappearing into the pockets of the railroad owners.

It is time that this should be looked at from the other side. Railroad builders, as a class, do not claim any great credit for unselfishness, nor for sacrifice for the public benefit; but all the same it remains true, that more than any other class they contribute to the general welfare and prosperity. The hue and cry may be raised in Congress about the enormous expanse of land granted for the benefit of railroad corporations; but the agitators will be careful to conceal the fact that one-half of the land reserved by the government in making these grants, is worth more with the railroads built, than the whole was without them, to say nothing of the immeasurable addition to safety and general convenience for military and other purposes. Efforts may also be made to get Congress to undertake the task of prescribing rates, or limitations upon charges for railroad service. All this would be very absurd, and could only lead to greater evils than those already proposed to be suppressed. Statistics show that the cost of transportation is growing less year by year; and that at the present time the provisions necessary to support a laborer in Massachusetts for six months, may be transported from the Upper Mississippi River for the equivalent of two days' labor. Such a thing a century ago would have been counted miraculous; and yet the clamor is greater to-day for some sort of blind arbitrary action in the Legislature than at any former period. It is difficult to account for this upon any other theory than the one which admits the fact that the talent, integrity and diligence of the country has gradually drifted into commercial channels, of which transportation may be said to be the concentrated expression. In former times, these were wont to be absorbed into the army and navy—the fighting professions. The lazy and indifferent part of a population, which seeks to obtain a living from the more industrious portion, naturally drifts into politics and into public office-holding. Here is cause enough for jealousy, and it is not a new thing, for jealousy between the same classes, the thrifty and the thriftless, has existed as far back as we have any recorded history of organized government. It requires no prophetic gift to foresee the result of a contest between such powers. The politicians will give way. They are overmatched, although they seek to ally with them, especially, the farmers and manual laborers. That part of their motive which is not born of jealousy is born of a baser passion, envious greed; and such defects may be expected to lead their avarice to get the better of their judgment, and surrender as they usually do to the purse-holders.

So eager and grasping is the pursuit of wealth in this part of the world, and in this age, that the winners in the race of accumulation, like those who participate in other contests, get more than their share of attention, and their value to the community is apt to be rated by the length of their purses. The ambition of young men is fired by the spectacle of great wealth; but this is merely an extreme development of a useful trait. The passion for accumulation is one which distinguishes the progressive from the non-progressive races of the earth. Here and there an excess or an unbalanced mind is led to downright dishonesty in order to get hold of wealth; but in general the example is beneficent, and if it results that the railroad builders and managers of the country gather more wealth, or accumulate it more rapidly than the other classes, it is not so much because they are railroad men, as because they have the penetration to see in the great game of competition where the fortunes are most likely to be made. In old times land-holding was the great source of wealth until, as in old countries, the competition became so keen that the income from landed estates was reduced to about three per cent. per annum, or even less. There were land barons in old days, but their power has been shorn by one another. There are railroad kings in our days, but the excessive competition which they are sure to meet, and not legislative restrictions, will diminish the chances in that field. Mr. VANDERBILT, or Mr. GOULD are pushing out new lines or perfecting old ones; and although they may not be conscious of it, are really doing a favor to the whole community. In a similar manner, Mr. HUNTINGTON and Mr. DILLON, by pushing out lines across the new and unsettled country, are accomplishing a veritable missionary work. The same men, and others with them—Mr. NICKERSON and Mr. PALMER, for instance—who are now pushing lines into the neighboring Republic of Mexico are, consciously or unconsciously, potent factors in civilizing and redeeming that portion of the world; and doing a more effective work than all the churches which exist there, or all the ecclesiastical missions ever opened. The railroad track not only disperses the troublesome red Indian, but also introduces the light of the highest civilization. The same thing may be said of the Southern States, and particularly of the great empire of Texas, which has been lifted forward in development and in all the elements of a better society half a century by the introduction among them of railroads, steam engines and all the accessories of modern transportation.

GREAT BRITAIN owns about twelve hundred and fifty million dollars' worth of ships engaged in carrying merchandise; the United States about one hundred and fifty million dollars' worth. A contemporary suggests that the disproportion in these figures could possibly be relieved in our favor, and that we could take advantage of the circumstance, that British interests suffer from the mischievous competition of cheaply-built and cheaply-run steamers. We do not see how these, to us desirable things could be done, excepting that arrangements were made by which United States steamships could compete at rates lower than those charged by the cheapest British vessels. Large subsidies

would be necessary to make such competition practicable, a further innovation upon the general principle, so generally accepted as incontrovertible by the great masters of political economy, that trade is best left to take care of itself.

Chicago and Atlantic Railway.

CHICAGO, June 23, 1883.

AMERICAN RAILROAD JOURNAL:—Upon his arrival in Chicago, a formal invitation was extended your representative, as follows: "The pleasure of your company is requested on Saturday, June 16, at the inauguration of the New Through Line of the Chicago and Atlantic Railway, etc., etc. S. W. Snow, General Passenger Agent." In company with an official of the Chicago and Atlantic Railway, I reached the Polk street depot at three P. M., and entered the train, composed of the finest cars of the Pullman pattern, a counterpart of the exhibit made at the Exposition of the cars to compose the through trains to the East, via the Chicago and Atlantic Railway. If space allowed, I would detail the unique and attractive features of these elegant trains. But the traveling public are familiar, before this, with the details, both by description and the travelers' test—use. I will quote some head-lines of an enthusiastic contemporary: "Gilt-edged," "A model of perfection, stability, comfort and splendor combined," as applied to the cars, the route, and management of the Erie's new acquisition. Each car is externally alike in decoration, and each bears the sign, "New York and Chicago Through Line via Erie Railway." The coaches were built by Pullman—the best that could be produced by that well-known interest. The wheels used are the Allen Paper Wheel, forty-two inches diameter, the largest in use by any road. The painting and decorations, interior and exterior, are with materials furnished by F. W. Devoe & Co. Brass trimmings are furnished by the Union Brass Manufacturing Co. The heating will be furnished by the Searle Hot Water Heater Co. The seats and springs are furnished by Z. Cobb & Son. The cars are splendidly illuminated by the new system of the Pintsch Lighting Co., of 19 William street, New York. The trains are drawn by the best of Brooks' Locomotives. Certain it is, that the enthusiastic sentence I copy from a circular of Colonel Snow, that "in equipment, the Chicago and Atlantic will not be excelled, if equaled, by any other road in the world," is the result aimed at by the management. The route is: from Chicago to Marion, Ohio, 143 miles; thence by the New York, Pennsylvania and Ohio, to Salamanca; and thence by the Erie to New York.

It is needless, perhaps, to say that the opening festivities during our trip of forty-nine miles and return, and the banquet, etc., during our stay off train at Boone Grove *en route*, were occasions of good feeling, enjoyed by the several hundred railroad men, newspaper attachés, and others who composed the party.

E.

A Becoming Death.

WITH No. 8, Vol. I, dated June 26, 1883, *The Patent Office News*, Washington, D. C., expired. Its last dying words are quotable because of their spirit and the moral they convey. They are as follows:

"In its initial number *The Patent Office News* announced that it had 'come to stay, if the class it was designed to serve wanted it to stay,' adding that it was 'not a philanthropic venture.' It has become evident that the class *The Patent Office News* was designed to serve do not care whether it stays or not. Many thousand copies have been distributed among inventors and manufacturers, as well as patent attorneys at home and abroad. The returns do not appear to us to justify a continuation of the publication, and with this number *The Patent Office News* ceases to exist. Patent attorneys and manufacturers have given us many kind words of encouragement, but it has not been found necessary to station a policeman at the door to preserve order in the procession of gentlemen crowding in to subscribe and advertise. Neither have the mail-carriers grown stoop-shouldered under the burden of postal orders, checks, and greenbacks sent in from the four corners of the earth. In brief, the venture has not proved so successful as was anticipated, and we propose to discontinue now rather than drag along to a more painful death further on. To those who have shown a disposition to help the infant enterprise along we return our hearty thanks, coupled with the wish that we could have given them more for their money."

LITERARY NOTES.

THE quarterly issue of *Bullion* is proving a hit. It exactly meets the convenience of those needing a current reference manual of our transportation interests, railroads, telegraphs and shipping, together. These form practically one system, so far as service is concerned, and in fact so far as intelligent dealings in any of their securities is concerned.

CINCINNATI as an industrial center is ably represented by *The Artisan*, published in that city, the June number of which comes to us in a larger and handier form, decidedly a pleasanter if not better informed visitor, than preceding issues, its every page possessing a winning, open countenance. We find its original contents good and interesting, and the selections made with the judgment of a well-practiced editor.

OF the various interesting matter contained in a pamphlet on Taylor's American Portland Cement, published by Johnson & Wilson, of No. 91 Liberty street, this city, and just received, we can only find room to say that the material indicated has been used with gratifying results and increasing sales, since 1875. Messrs. Johnson & Wilson now own facilities for the production of five thousand barrels of cement a month, and their product is found to be at least equal to imported Portland cement. The interesting pamphlet before us establishes this fact, among other ways, by the reproduction of a history of the jetties at the mouth of the Mississippi River, written by E. L. Corthell, C. E., chief assistant and resident engineer during their construction. We unhesitatingly advise all who use Portland cement to procure and read the interesting pages under review.

AMONG our most valued exchanges is *The Times-Democrat*, of New Orleans. This admirable newspaper is very readable and well-informed every day of the week, and its Sunday issue, usually a much larger production than the paper is on other days, fills the place of a live weekly magazine in the households doing themselves the service to take it. The correspondence of the *Times-Democrat* is useful, racy and comprehensive, representing all the principal centers of business and society, throughout the United States. In literary ability, the amount and variety of information contained in its columns, and acceptability as a wide-awake and enterprising newspaper, the *Times-Democrat*, of New Orleans, is very superior; and the interest with which we regard it is heightened by its peculiarities as a Southern newspaper, published in far-away Louisiana.

THE illustrated price list of Riehlé Brothers' Standard Scales and Trucks and their Testing Machine catalogue embody a large amount of useful information presented in an attractive form. Both are procurable by application to the Philadelphia Scale and Testing Machine Works. These works were established as long ago as 1846, and the superiority of the machinery made in them admits of no question and needs no mention. We observe that the Riehlé Brothers' Testing Machines are used by the United States Government and by many leading manufacturers both on this continent and in Europe.

A NEWPORT (R. I.) newspaper lately proposed a new plan for the reformation of prison discipline—that prisoners should be paid for the labor which they perform, taught by experience the true value of liberty, and be given a practical experience of the value to the individual of harmonious society. The subject is dealt with interestingly, and with strength and good feeling in the July number of the *Century Magazine*.

RAILROAD EARNINGS.—MONTHLY.

B., C. Rap. & N.:	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1881	167,750	124,510	148,551	184,680	165,630	205,912	174,351	209,112	221,801	221,748	202,180	232,812	2,259,037
1882	252,823	225,631	224,107	178,304	199,278	186,143	198,276	224,921	261,439	300,155	278,439	246,062	2,800,679
1883	197,402	187,001	252,913	218,253	208,671	217,574	.....	.....	.....	.....	.....	.....	.....
Central Pacific:													
1881	1,602,907	1,454,218	1,709,638	1,872,370	2,091,411	2,159,382	1,899,346	2,088,519	2,185,303	2,507,857	2,297,971	2,225,179	24,094,101
1882	1,839,469	1,720,675	1,969,737	2,054,687	2,342,298	2,229,105	2,076,648	2,350,557	2,495,445	2,424,529	2,139,299	2,020,349	25,662,757
1883	1,718,000	1,424,000	2,021,000	2,035,000	2,099,000	.....	.....	.....	.....	.....	.....	.....	.....
Chesapeake and Ohio:													
1881	162,540	184,389	228,479	227,343	252,235	241,135	225,096	262,858	247,144	236,396	230,022	203,562	2,702,762
1882	208,746	179,053	215,445	267,454	257,040	271,381	306,831	371,175	332,219	347,882	287,850	.....	.....
1883	244,142	250,287	270,676	279,659	331,173	326,525	.....	.....	.....	.....	.....	.....	.....
Chicago and Alton:													
1881	499,120	474,318	529,915	558,190	548,555	635,860	676,205	769,751	774,790	771,844	672,380	646,812	7,557,740
1882	585,830	517,897	588,700	564,861	559,577	617,250	702,635	856,398	912,692	858,674	749,915	701,066	8,215,495
1883	637,804	538,537	671,576	584,981	630,097	653,539	.....	.....	.....	.....	.....	.....	.....
Chicago and Northwestern:													
1881	1,240,664	963,204	1,178,795	1,474,612	1,879,006	2,306,440	1,983,032	2,315,164	2,292,676	2,341,098	2,019,038	1,855,477	21,849,209
1882	1 644,935	1,474,176	1,672,931	1,668,741	2,110,947	2,043,516	2,025,736	2,099,755	2,497,053	2,532,100	2,069,287	1,718,379	23,828,973
1883	1,382,704	1,264,907	2,059,700	1,742,900	2,122,698	2,175,528	.....	.....	.....	.....	.....	.....	.....
Chicago, Burlington and Quincy:													
1881	1,307,948	1,034,821	1,418,149	1,574,371	1,679,455	2,083,803	1,888,358	2,173,045	2,262,981	2,031,001	1,816,133	1,905,490	21,176,455
1882	1 658,834	1,457,300	1,566,217	1,530,838	1,505,261	1,437,164	1,625,006	2,086,858	2,186,400	2,270,444	2,199,421	2,027,060	22,550,804
1883	1,625,680	1,611,021	2,396,583	1,824,130	2,009,872	.....	.....	.....	.....	.....	.....	.....	.....
Chicago, Milwaukee and St. Paul:													
1881	990,848	682,718	916,990	1,259,946	1,538,491	1,729,812	1,568,706	1,678,361	1,644,67c	1,591,053	1,569,598	1,854 269	17,025,462
1882	1,434,537	1,376,377	1,561,386	1,517,569	1,627,932	1,619,431	1,464,927	1,545,199	1,950,710	2,250,975	2,072,973	1,964,709	20,386,726
1883	1,359,000	1,258,000	2,044,000	1,972,000	2,034,000	2,023,000	.....	.....	.....	.....	.....	.....	.....
Chicago, St. Paul, Minneapolis and Omaha:													
1881	257,786	158,594	251,648	261,211	350,124	404,562	383,202	385,586	373,370	379,029	592,921	432,615	3,981,296
1882	327,498	333,200	413,200	377,288	402,882	374,694	331,480	394,555	482,997	546,671	317,595	375,796	4,973,052
1883	302,700	277,900	415,800	419,535	446,746	428,934	.....	.....	.....	.....	.....	.....	.....
Denver and Rio Grande:													
1881	307,476	317,681	398,493	433,111	514,767	584,230	548,284	606,193	589,287	638,432	547,055	626,728	5,980,488
1882	488,599	407,000	521,500	556,917	606,400	531,700	495,797	574,040	595,306	630,598	512,965	443,000	6,349,857
1883	418,300	433,400	521,600	573,700	631,900	639,600	.....	.....	.....	.....	.....	.....	.....
Hannibal and St. Joseph:													
1881	154,401	122,874	176,356	190,812	172,950	190,740	201,899	210,240	215,103	231,913	195,607	194,336	2,230,961
1882	125.601	152,691	185,368	158,113	165,630	147,526	184,609	254,569	239,732	238,563	249 252	239,891	2,303,388
1883	179,591	180,887	228,410	193,481	194,394	.....	.....	.....	.....	.....	.....	.....	.....
Illinois Central:													
1881	631,281	524,499	557,789	662,493	673,259	803,887	720,004	868,407	828,847	815,238	737 218	763,475	8,586,397
1882	1,019,453	987,998	995,474	887,543	891,328	858,861	752,251	813,600	828,238	865,325	752,144	697,051	8,831,281
1883	1,058,620	931,971	1,106,658	888,431	947,216	935,108	.....	.....	.....	.....	.....	.....	.....
Indiana, Bloomington and Western:													
1881	90,283	83,261	192,085	203,677	200,064	199,846	199,125	272,114	247,332	225,678	200,450	192,622	2,487,569
1882	195,824	175,755	204,538	205,934	182,554	186,133	206,072	278,814	273,1c0	269,046	256,998	205,212	2,641,675
1883	248,142	202,931	268,801	215,912	234,151	.....	.....	.....	.....	.....	.....	.....	.....
Louisville and Nashville:													
1881	812,118	805,124	947,959	855,704	828,726	1,227,885	817,135	876,192	951,566	1,002,950	1,065,223	1,153,779	11,344,361
1882	964,527	960,315	1,068,834	953,603	958,130	1,215,490	1,063,765	1,043,912	1,114,513	1,215,932	1,192,390	1,221,509	12,981,432
1883	1,118,735	1,015,000	1,141,337	941,129	1,050,615	.....	.....	.....	.....	.....	.....	.....	.....
Mobile and Ohio:													
1881	224,347	216,768	230,916	163,551	145,803	136,517	135,546	160,789	210,262	256,924	262,986	258,812	2,403,224
1882	159,676	158,590	148,166	141,957	134,378	136,184	135,174	137,475	157,874	267,433	295,110	307,643	2,179,666
1883	216,608	172,200	180,113	128,462	143,294	124,640	.....	.....	.....	.....	.....	.....	.....
Nashville, Chattanooga and St. Louis:													
1881	178,143	190,866	207,710	183,525	104,430	154,549	150,430	168,317	179,979	172,121	152,059	173,127	2,075,258
1882	170,753	174,974	177,336	167,393	154,163	119,074	160,991	168,304	168,999	180,319	181,336	186,352	1,933,047
1883	197,388	195,262	206,164	161,435	171,079	.....	.....	.....	.....	.....	.....	.....	.....
New York and New England:													
1881	189,749	173,614	212,019	216,913	217,185	231,518	246,821	280,524	299,573	261,200	240,764	240,063	2,809,255
1882	213,840	217,261	265,222	261,044	289,722	285,392	298,441	346,490	338,347	310,145	276,183	261,082	3,408,169
1883	258,266	231,741	284,869	268,853	290,951	293,919	.....	.....	.....	.....	.....	.....	.....
New York, Lake Erie and Western:													
1880	1,296,381	1,252,218	1,644,958	1,643,151	1,592,544	1,661,812	1,580,976	1,606,874	1,786,417	1,899,910	1,799,338	1,726,788	19,149,361
1881	1,443,437	1,425,765	1,847,261	1,709,057	1,776,891	1,794,982	1,787,081	1,772,895	1,734,200	1,814,866	1,715,469	1,571,208	20,393,112
1882	1,318,997	1,304,757	1,567,632	1,670,749	.....	.....	.....	.....	.....	1,819,010	1,818,824	1,691,404	20,203,469
1883	1,524,869	1,283,616	1,696,969	1,548,474	.....	.....	.....	.....	.....	.....	.....	.....	.....
Northern Central:													
1881	386,157	382,657	452,906	487,273	465,588	487,287	440,811	498,008	429,565	449,664	487,160	476,622	5,443,697
1882	407,368	413,551	414,789	420,490	465,694	482,752	509,683	667,488	592,435	550,225	526,685	490,003	5,800,176
1883	499,252	486,865	506,864	476,335	499,133	.....	.....	.....	.....	.....	.....	.....	.....
Northern Pacific:													
1881	116,508	78,803	162,984	216,210	312,705	412,024	393,260	434,085	534,363	583,955	475,610	439,724	4,044,576
1882	245,369	268,935	373,141	451,023	616,231	704,617	694,067	727,215	772,838	829,831	761,324	564,749	7,009,344
1883	392,035	373,091	583,400	675,200	775,600	.....	.....	.....	.....	.....	.....	.....	.....
Philadelphia and Erie:													
1881	224,303	225,501	285,573	293,323	343,792	350,585	291,669	303,849	276,522	292,392	284,078	282,772	3,454,309
1882	252,727	246,246	265,311	277,851	341,415	347,614	377,206	20,3294	386,455	397,164	369,583	335,513	4,011,413
1883	319,720	295,638	308,069	311,636	363,359	.....	.....	.....	.....	.....	.....	.....	.....
St. Louis and San Francisco:													
1881	212,435	178,234	262,050	265,298	283,399	260,254	252,333	286,373	279,064	308,569	284,320	287,914	3,160,245
1882	256,784	244,654	274,959	242,806	253,419	241,200	318,613	381,637	336,805	360,900	331,490	339,424	3,582,811
1883	278,321	236,278	351,689	274,011	296,756	259,800	.....	.....	.....	.....	.....	.....	.....
St. Louis, Alton and Terre Haute:													
1881	175,725	166,012	201,137	197,447	172,177	165,896	165,393	189,180	196,368	204,338	169,795	171,127	2,112,801
1882	168,987	149,619	177,609	165,401	162,842	142,742	192,017	236,137	217,659	229,962	206,040	184,526	2,245,320
1883	193,614	177,717	204,762	160,805	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Louis, Iron Mountain and Southern:													
1881	570,957	560,791	704,002	548,300	479,075	474,302	533,512	644,386	708,325	719,239	687,271	709 498	7,319,744
1882	516,370	501,127	585,008	581,977	519,120	529,700	515,519	675,981	724,160	809,394	843,973	781,305	7,581,635
1883	665,258	522,781	632,228	.....	558,788	.....	.....	.....	.....	.....	.....	.....	.....
St. Paul, Minneapolis and Manitoba:													
1881	254,187	159,482	320,962	425,685	382,642	405,322	387,488	414,954	485,736	605,708	508,530	528,262	4,878,960
1882	395,461	418 358	531,071	570,890	858,902	856,417	853,296	801,759	832,776	979,057	913,335	753,515	8,764,770
1883	489,763	389,612	729,844	812,008	727,499	.....	.....	.....	.....	.....	.....	.....	.....
Texas and Pacific:													
1881	281,176	260,781	319,928	295,066	281,782	285,305	328,063	381,331	345,790	419,203	369,521	401,058	3,921,569
1882	323,987	278,535	343,442	359,543	421,219	384,713	367,215	439,918	470,613	541,901	619,655	641,044	5,143,179
1883	534,529	416,040	526,901	.....	496,278	.....	.....	.....	.....	.....	.....	.....	.....
Union Pacific Railway:													
1881	1,339,799	1,374,740	1,674,860	1,766,894	2,319,238	2,884,774	2,528,826	2,638,659	2,844,357	3,169,530	2,723,608	2,267,004	29,776,899
1882	2,186,020	1,835,620	2,392,593	2,369,609	2,491,590	2,508,453	2,301,000	2,762,107	2,949,112	3,158,337	2,821,070	2,294,000	30,088,109
1883	1,986,535	1,743,207	2,489,405	2,435,844	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wabash, St. Louis and Pacific:													
1881	865,339	813,374	1,109,399	967,033	1,148,669	1,339,944	1,120,615	1,542,124	1,497,246	1,406,029	1,372,360	1,294,657	14,467,790
1882	1,220,965	1,134,768	1,313,776	1,378,191	1,204,864	1,149,632	1,418,837	1,772,544	1,682,382	1,595,680	1,525,715	1,331,952	16,738,360
1883	1,307,783	1,070,758	1,479,236	.....	1,213,946	.....	.....	.....	.....	.....	.....	.....	.....

RAILROAD, TRAMWAY AND CANAL DIVIDEND STATEMENT.

Showing the amount of Stock Outstanding, the Dividend Periods and the date of last Dividend.

Marked thus (*) are leased roads.		Stock outstanding.	Divide'd Periods.	Last Dividend Payable.
Albany and Susquehanna*	100	3 500,000	semi-an	July 1, '83 2
Atchison, Topeka and Santa Fe	100	56,932,200	q'arterly	Aug. 15, '83 1½
Atlanta and Charlotte Air Line	100	1,700,000	semi-an	Mar. 5, '83 2
Atlanta and West Point	100	1,232,200	semi-an	Aug. 1, '83 3
Atlantic and St. Lawrence*	100	5,484,000	semi-an	Mar. 15, '83 3½
Augusta and Savannah	100	1,032,200	semi-an	Dec. 4, '82 3½
Baltimore & Hanover	100	88,805	.....	Apl. 9, '83 3
Baltimore and Ohio	100	14,792,566	semi-an	May 1, '83 5
" " pref.	100	5,000,000	semi-an	July 1, '83 3
Washington Branch	100	1,650,000	q'arterly	May 1, '83 5
Berkshire*	100	600,000	annual	Apl. 2, '83 1¾
Boston and Albany	100	20,000,000	q'arterly	May 30, '83 2
Boston & New York Air Line pref.	100	2,795,227	semi-an	Apl. 15, '83 2
Boston, Concord & Montreal pref*	100	800,000	semi-an	May 15, '833
Boston and Lowell	500	3,792,000	semi-an	July 1, '83 2½
Boston and Maine	100	7,000,000	semi-an	May 15, '83 4
Boston & Providence	100	4,000,000	semi-an	May 1, '83 4
Attleborough Branch	100	131,700	semi-an	July 1, '83 3½
Boston, Revere Beach & Lynn	100	650,000	semi-an	July 1, '83 3
Buffalo, New York & Erie*	500	950,000	semi-an	June 1, '83 3
Buffalo, New York & Philadelphia pf.	50	6,000,000	q'arterly	June 25, '83 1½
Camden & Atlantic	50	377,400	q'arterly	Nov. 1, '82 4
" " pref.	100	880,650	q'arterly	Nov. 1, '82 3
Camden & Burlington County	100	381,925	semi-an	July 1, '83 3
Canada Southern	100	15,000,000	.....	Aug. 1, '83 2
Cape May & Millville*	50	447,000	semi-an	June 1, '83 3
Catawissa	50	1,159,500	annual	Oct. 1, '82 2½
" pref	00	2,200,000	semi-an	May 16, '83 3½
" new pref.	50	1,000,000	semi-an	May 16, '83 3½
Cayuga and Susquehanna*	50	589,110	semi-an	July 1, '83 4½
Cedar Rapids & Missouri River*	100	6,850,400	q'arterly	May 1, '83 1½
" " " pref.	100	769,600	semi-an	Feb. 1, '83 3½
Central of Georgia	100	7,500,000	semi-an	June 26, '83 4
Central Ohio*	50	2,437,950	semi-an	July 31, '83 3
" pref.	50	411,550	semi-an	July 31, '83 3
Central of New Jersey*	100	18,563,200	q'arterly	Dec. 1, '83 1½
Central Pacific	150	59,275,500	semi-an	Feb. 1, '83 3
Cheshire preferred	100	2,153,300	semi-an	July 16, '83 1½
Chicago and Alton	100	12,504,600	semi-an	Mar. 1, '83 4
" " pref	100	2,425,400	semi-an	Mar. 1, '83 4
Chicago, Burlington & Quincy	100	69,814,191	q'arterly	June 15, '83 2
Chicago, Iowa & Nebraska*	100	3,916,200	semi-an	July 1, '83 4
Chicago, Milwaukee & St. Paul	100	27,904,261	semi-an	Apl. 16, '83 3½
" " " pref.	100	16,540,983	semi-an	Apl. 16, '83 3½
Chicago & Northwestern	100	16,737,655	semi-an	June 28, '83 3½
" " pref.	100	22,210,844	q'arterly	June 28, '83 2
Chicago, Rock Island & Pacific	100	41,960,000	q'arterly	Aug. 1, '83 1¾
Chicago & West Michigan	100	6,796,800	semi-an	Feb. 15, '83 3
Chicago, St. Paul, Minn. & Omaha pf.	100	11,396,600	q'arterly	July 20, '83 1¾
Cincinnati, Hamilton & Dayton	100	3,500,000	semi-an	Jan. 5, '83 3
" " " pref.	100	347,900	q'arterly	July 1, '83 1¼
Cincinnati, Ind., St. Louis & Chicago.	100	8,000,000	q'arterly	July 16, '83 1½
Cincinnati, Sandusky & Cleveland pf.	50	428,850	semi-an	May 1, '83 3
Cleveland Columbus, Cincin. & Ind.	100	14,991,800	.....	Feb. 1, '83 2
Cleveland & Pittsburg*	50	11,235,430	q'arterly	June 1, '83 1¾
Columbus & Xenia*	50	1,786,200	q'arterly	June 10, '83 2
Columbus, Hocking Valley & Toledo	100	10,316,500	.....	Jan. 10, '83 2½
Concord	50	1,500,000	semi-an	May 1, '83 5
Concord and Portsmouth*	100	350,000	semi-an	June 28, '83 3½
Connecticut & Passumpsic Rivers	100	2,244,460	semi-an	Aug. 1, '83 3
Connecticut River	100	2,370,000	semi-an	July 1, '83 4
Cumberland Valley	50	1,292,950	q'arterly	July 2, '83 2½
" 1st pref.	50	241,900	semi-an	July 2, '83 4
" 2d pref.	50	243,000	semi-an	July 2, '83 4
Danbury & Norwalk	50	600,000	semi-an	Apl. 1, '83 2½
Dayton and Michigan*	50	2,402,573	semi-an	Apl. 1, '83 1¾
" " pref.	50	1,211,250	q'arterly	July 1, '83 2
Delaware*	25	1,468,940	semi-an	July 2, '83 3
Delaware & Bound Brook*	100	1,652,000	q'arterly	May 14, '83 1¾
Delaware, Lackawanna & Western	50	26,200,000	q'arterly	July 20, '83 2
Denver & Rio Grande	100	33,000,000	q'arterly	Jan. 14, '82 1½
Detroit, Lansing & Northern	100	1,825,600	semi-an	Feb. 15, '83 3
" " " pref.	100	2,503,380	semi-an	Feb. 15, '83 3
Dubuque & Sioux City*	100	5,000,000	semi-an	Apl. 16, '83 3
East Pennsylvania*	50	1,709,550	semi-an	July 17, '83 3
East Mahanoy*	50	392,950	semi-an	July 16, '83 3
Eastern (N. H.)	100	492,500	semi-an	June 15, '83 2½
Eel River	100	3,000,000	q'arterly	June 5, '83 1
Elmira & Williamsport*	50	500,000	semi-an	May 1, '83 2½
" " pref.	50	500,000	semi-an	July 1, '83 3½
Erie and Pittsburgh*	50	1,998,400	q'arterly	June 10, '83 1¾
European & North American	100	2,500,000	semi-an	Apl. 1, '83 2½
Evansville & Terre Haute	50	3,100,000	.....	Jan. 1, '83 6b
Fitchburg	100	4,950,000	semi-an	July 1, '83 3
Flint & Pere Marquette pref.	100	6,500,000	semi-an	July 16, '83 3½
Fort Wayne & Jackson pref.	100	2,284,800	.....	May 4, '82 2
Georgia	100	4,200,000	q'arterly	July 15, '83 2½
Granite	100	1,250,000	semi-an	July 2, '83 3
Greenwich & Johnsonville	100	118,000	semi-an	Jan. 1, '83 4
Hannibal & St. Joseph pref.	100	5,083,024	semi-an	Feb. 15, '83 3
Harrisburg & Lancaster	50	1,182,500	semi-an	July 10, '83 3½
Hartford & Connecticut Western	100	2,700,000	.....	Dec. 1, '82 1½
Housatonic pref.	100	1,180,000	q'arterly	July 16, '83 2
Illinois Central	100	39,000,000	semi-an	Mar. 1, '83 4
Iowa Falls & Sioux City*	100	4,623,500	q'arterly	June 1, '83 1½
Iowa R.R.& Land Co.	100	7,620,000	q'arterly	May 1, '83 1
Joliet and Chicago*	100	1,500,000	q'arterly	July 1, '83, 1¾
Kansas City, Fort Scott & Gulf	100	4,648,000	.....	Feb. 15, '83 3
" " " pref.	100	2,750,000	semi-an	Feb. 15, '83, 4
Lake Shore & Michigan Southern	100	49,466,500	q'arterly	Aug. 1, '83, 2
" " (guar.)	100	533,500	semi-an.	Aug. 1, '83, 5
Lawrence*	50	450,000	q'arterly	July 1, '83, 2

Marked thus (*) are leased roads.		Stock outstanding.	Divide'd Periods.	Last Dividend Payable.
Lehigh Valley	50	27,496,895	q'arterly	July 16, '83 2
" pref.	50	106,300	q'arterly	July 16, '83 2½
Little Miami	50	4,637,300	q'arterly	June 10, '83 2
Little Schuylkill*	50	2,646,100	semi-an.	July 13, '83 4½
Long Island	50	10,000,000	q'arterly	Aug. 1, '83 1
Louisville & Nashville	100	25,000,000	semi-an.	Feb. 1, '82 3
Lowell & Andover	100	500,000	semi-an.	Jan. 1, '83 3½
Lykens Valley	20	600,000	q'rterly.	Jan. 3, '83 2½
Maine Central	100	3,603,300	semi-an.	Feb. 15, '83 2½
Manchester & Lawrence	100	1,000,000	semi-an.	May 1, '83 5
Manhattan	100	13,000,000	.....	.....
" 1st pref.	100	6,500,000	q'rterly.	July 2, '83 1½
" 2d pref.	100	6,500,000	q'rterly.	Jan. 2, '83 1½
Marquette, Houghton & Ontonagon	100	2,756,600	.....	Feb. 15, '83 4
" " pref.	100	2,259,026	semi-an.	Feb. 15, '83 4
Massawippi*	100	400,000	semi-an.	Aug. 1, '83 3
Metropolitan	100	6,500,000	q'rterly	Oct. 2, '82 1½
Michigan Central	100	18,738,204	semi-an.	Aug. 1, '83 3
Middlesex Central	100	280,000	semi-an.	Feb. 1, '83 3
Mill Creek & Minehill*	50	323,000	semi-an.	July 1, '83 5
Mine Hill & Schuykill Haven*	50	4,022,500	semi-an.	July 1 3, '83 3½
Missouri Pacific	100	30,000,000	q'rterly.	July 2, '83 1¾
Morris and Essex	50	15,000,000	semi-an.	July 2, '83 3½
Mount Carbon & Port Carbon	50	282,350	semi-an.	July 2, '83 6
Nashua and Lowell	100	800,000	semi-an.	May 1, '83 4
Nashua & Rochester	100	1,305,800	semi-an.	Apl. 2, '83 1½
Nashville & Decatur	100	1,356,632	semi-an.	June 10, '83 3
Nashville, Chattanooga & St. Louis	25	6,670,325	semi-an.	Apl. 20, '82 1½
Naugatuck	100	2,000,000	semi-an.	Jan. 15, '83 5
Nesquehoning Valley*	50	1,300,000	semi-an.	Mar. 1, '83 3
New Castle & Beaver Valley*	50	700,000	q'rterly.	July 1, '83 —
New London Northern*	100	1,500,000	q'rterly.	July 1, '83 1¼
New York Central & Hudson River	100	89,428,330	q'rterly.	July 16, '83 2
New York and Harlem	100	8,500,000	semi-an.	July 2, '83 4
" " pref.	100	1,500,000	semi-an.	July 2, '83 4
" City Line	—	.....	annual	Apl. 2, '83 2
New York, Lackawanna & Western	100	10,000,000	q'rterly	Apl. 2, '83 1¼
New York, Lake Erie & Western	100	77,087,600	.....	.....
" " " pref.	100	7,987,500	annual.	Jan. 2, '83 6
New York, New Haven & Hartford	100	15,500,000	semi-an.	July 2, '83 5
New York, Ontario & Western pref.	100	2,000,000	.....	Mar. 1, '83 12
New York, Providence & Boston	100	3,000,000	q'rterly.	May 10, '83 2
Niagara Bridge & Canandaigua*	100	1,000,000	semi-an.	July 1, '83 3
North Carolina*	100	3,000,000	semi-an.	Sept. 1, '83 3
" " pref.	100	1,000,000	semi-an.	Sept. 1, '83 3
Norfolk & Western pref.	—	15,000,000	q'rterly.	Dec. 15, '82 $1
Northeastern (South Carolina)	50	899,350	.....	Apl. 2, '83 3
North Pennsylvania	50	4,399,750	q'rterly.	May 25, '83 1¾
Northern Central	50	6,500,000	semi-an.	July 1, '83 4
Northern New Hampshire	100	3,068,400	semi-an.	June 1, '83 3
Northern Pacific pref.	100	41,909,132	.....	Jan. 15, '83 11.1
Norwich & Worcester*	100	2,604,400	semi-an.	July 10, '83 5
Oregon & Transcontinental	100	40,000,000	q'rterly.	July 16, '83 1½
Old Colony	100	7,533,800	semi-an.	July 2, '83 3½
Oregon Improvement Co.	100	5,000,000	semi-an.	Mar. 1, '83 3½
Oregon Railway & Navigation Co.	100	18,000,000	q'rterly.	May 1, '83 2½
Oswego & Syracuse	100	1,320,400	semi-an.	Aug. 1, '83 4½
Panama	100	7,000,000	semi-an.	Jan. 10, '83 6½
Paterson & Hudson*	100	630,000	semi-an.	July 3, '83 4
Paterson & Ramapo	100	248,000	semi-an.	July 1, '83 4½
Pemberton & Hightstown*	50	342,150	semi-an.	July 1, '83 3
Pennsylvania	50	85,751,550	semi-an.	May 29, '83 4
Pennsylvania Co.	50	20,000,000	semi-an.	June 15, '83 2
Peoria & Bureau Valley*	100	1,500,000	semi-an.	Aug. 1, '83 4
Philadelphia, Ger. & Norrist'n*	50	2,231,900	q'rterly.	June 3, '83 3
Philadelphia and Trenton	100	1,259,100	q'rterly.	July 10, '83 2½
Philadelphia, Wilmington and Balt.	50	11,795,050	semi-an.	July 2, '83 4
Pittsburgh, Fort Wayne & Chicago*	100	19,714,285	q'rterly.	July 3, '83 1¾
" Special Imp.	100	7,698,900	q'rterly.	July 2, '83 1¾
Pittsfield & North Adams	100	450,000	semi-an.	July 1, '83 2½
Portland, Saco & Portsmouth	100	1,500,000	semi-an.	July 15, '83 3
Providence & Worcester	100	2,500,000	semi-an.	July 1, '83 3
Rensselaer & Saratoga*	100	6,854,100	semi-an.	July 2, '83 4
Richmond & Danville	100	5,000,000	q'rterly.	Aug. 15, '82 2
Richmond & Petersburg	100	1,009,300	semi-an.	Aug. 1, '82 2
Rochester & Genesee Valley*	100	555,200	semi-an.	July 1, '83 3
Rome, Watertown & Ogdensburg	100	5,293,900	.....	Jan. 1, '83 3
Rutland preferred	100	4,000,000	semi-an.	Sept. 1, '82 1
Spuyten Duyvil & Port Morris	100	989,000	semi-an.	Jan 2, '83 4
St. Louis, Alton & Terre Haute pref.	100	2,468,406	.....	May 1, '83 7
St. Louis & San Francisco 1st pref.	100	4,500,000	semi-an.	Aug. 1, '83 3½
St. Louis, Jacksonville & Chicago	100	1,293,000	.....	Aug. 1, '83 5
" " " pref.	100	1,034,000	.....	Aug. 1, '83 5
St. Paul & Duluth pref.	100	5,121,700	semi-an.	July 1, '83 3½
St. Paul, Minneapolis & Manitoba	100	20,000,000	q'rterly.	Aug. 1, '83 2
Schuylkill Valley*	50	576,050	semi-an.	Jan. 15, '83 2½
Seaboard & Roanoke	100	1,302,200	semi-an.	May 1, '83 5
Shamokin Valley & Pottsville	50	869,450	semi-an.	Feb. 1, '83 3
Shore Line*	100	1,000,000	semi-an.	July 5, '83 4
Sioux City & Pacific pref.	100	169,000	semi-an.	Apl. 2, '83 3½
South Branch (N. J.)*	100	438,300	semi-an.	Jan. 2, '83 3
South Western (Ga.)*	100	5,031,700	semi-an.	June 26, '83 3½
Stockbridge & Pittsfield*	100	448,700	q'rterly.	Apl. 2, '83 1½
Sunbury & Lewistown	50	161,000	semi-an.	Apl. 2, '83 3
Syracuse, Binghamton & New York*	100	2,500,000	semi-an.	Feb. 1, '83 2
Terre Haute & Indianapolis	100	1,988,150	semi-an.	Feb. 1, '83 4
Union Pacific	100	60,854,105	q'rterly.	July 2, '83 1¾
United Companies of New Jersey*	100	21,090,400	q'rterly.	July 10, '83 2½
Utica, Shenango & Susq. Valley	100	4,000,000	semi-an.	May 1, '83 3
Utica and Black River	100	1,772,000	semi-an.	Mar 31, '83 2
Vermont and Massachusetts	100	3,050,000	semi-an.	Apl. 7, '83 3
Vermont Valley	100	1,000,000	annual	June 30, '83 3

RAILROAD, TRAMWAY AND CANAL DIVIDEND STATEMENT.

(CONTINUED.)

Showing the amount of Stock Outstanding, the Dividend Periods and the date of last Dividend.

Marked thus (*) are leased roads.	Stock out-standing.	Divide'd Periods.	Last Dividend Payable.
Ware River* 100	750,000	semi-an.	July 5, '83 3½
Warren (N. J.) 100	1,800,000	semi-an.	Apl. 1, '83 3½
West Jersey 50	1,375,800	semi-an.	Mar. 15, '83 3g
Wilmington & Weldon 100	2,082,400	semi-an.	July 16, '83 3
Wilmington, Columbia & Augusta 100	960,000	semi-an.	July 10, '83 3
Winchester & Potomac* 100	180,000	semi-an.	July 1, '83 3
Winchester & Strasburg* 100	74,700	semi-an.	July 1, '83 3
Worcester & Nashua 75	1,789,800	semi-an.	July 1, '83 1¾
TRAMWAYS.			
Baltimore City 25	1,000,000	annual	Jan. 1, '83 3
Baltimore, Catonsville & El. Mills 100	80,000	semi-an.	Jan. 1, '83 2½
Bleecker Street & Fulton Ferry 100	900,000	semi-an.	July 1, '82 ¾
Boston & Chelsea pref. 50	110,000	semi-an.	Apl. 2, '83 3
Broadway (Brooklyn) 100	250,000	semi-an.	Apl. 1, '83 3
Broadway & 7th Avenue (New York) 100	2,100,000	q'arterly	Apl. 1, '83 2
Brooklyn City & Newtown 100	880,600	q'arterly	Apl. 1, '83 3
Brooklyn City 100	2,000,000	semi-an.	May. 1, '83 3½
Bushwick (Brooklyn) 100	400,000	q'arterly	Apl. 1, '83 3
Cambridge (Mass.) 100	908,000	semi-an.	Apl. 2, '83 4½
Central Park, North & East River 100	1,800,000	q'arterly	Apl. 1, '83 2
Christopher & Tenth Street 100	650,000	q'rterly.	Feb. 1, '83 2½
Citizens' (Phil.) 50	192,500	semi-an.	Apl. 1, '83 2½
Citizens' (Pbg.) 50	200,000	q'rterly.	.. ....'80 14½
Coney Island & Brooklyn 100	500,000	semi-an.	July 1, '83 3
Continental (Phil.) 50	580,000	semi-an.	Jan. 1, '83 –
Dry Dock, East Broadway & Battery 100	1,200,000	semi-an.	May 1, '83 3
Eighth Avenue (New York) 100	1,000,000	q'arterly	Apl. 1, '83 3
Forty-second St. & Grand St. Ferry 100	748,000	q'rterly.	May 1, '83 6
Frankford & Southwark (Phila.) 50	600,000	semi-an.	Apl. 1, '83 4
Germantown, (Phila.) 50	1,540,902	q'rterly.	July 1, '83 2¼
Girard College (Phila.) 50	500,000	q'rterly.	July 1, '71 3
Grand Street & Newtown 100	170,000	semi-an.	Jan. 1, '83 2½
Green & Coates Street (Phila.) 50	708,650	semi-an.	July 13, '83 3
Hestonville, Mantua & Fairmount 50	299,381	q'rterly.	Jan. 1, '75 4
Highland (Boston) 100	600,000	semi-an.	July 1, '83 4
Lombard & South Streets (Phila.) 25	195,000	semi-an.	Oct. 1, '75 4
Lynn and Boston 100	200,000	semi-an.	May 1, '83 4
Metropolitan (Boston) 50	1,500,000	semi-an.	July 2, '83 4
Middlesex (Boston) 100	650,000	semi-an.	May 15, '83 3½
Ninth Avenue (New York) 100	797,320	semi-an.	.....
People's (Phila.) pref. 25	115,250	.....	July 1, '82 2
Philadelphia City 50	475,000	semi-an.	July 1, '82 4
Philadelphia and Darby 20	200,000	semi-an.	July 1, '81 3½
Philadelphia & Grey's Ferry 50	308,000	semi-an.	Jan. 1, '82 6
Pittsburgh, Allegheny & Manchester 50	300,000	q'rterly.	Oct. 1, '81 3
Ridge Avenue (Phila.) 50	420,000	semi-an.	Apl. 1, '83 5½
Second Avenue (New York) 100	1,199,500	semi-an.	Jan. 1, '83 2½
Second & Third Streets (Phila.) 50	771,076	q'rterly.	July 9, '83 4
Seventeenth & Nineteenth sts (Phila.) 50	250,000	semi-an.	July 1, '81 3
Sixth Avenue (New York) 100	750,000	semi-an.	May 1, '83 4½
Somerville (Boston) 100	113,000	semi-an.	May 1, '83 3
South Boston 50	600,000	semi-an.	July 2, '83 4
Third Avenue, (New York) 100	2,000,000	q'rterly.	May 1, '83 5
Thirteenth & Fifteenth Sts. (Phila.) 50	334,529	q'rterly.	Apl. 1, '83 4
Twenty-third Street (New York) 100	600,000	semi-an.	Feb. 1, '83 4
Union, (Boston) 100	374,300	semi-an.	Jan. 2, '62 4
Union, (Phila.) 50	751,100	semi-an.	Jan. 1, '83 –
West Philadelphia 50	750,000	semi-an.	July 1, '77 10
CANALS.			
Chesapeake and Delaware 50	2,078,038	semi-an.	June 1, '75 2
Delaware Division 50	674,950	semi-an.	Feb. 15, '83 2
Delaware and Hudson 100	20,000,000	q'rterly.	June 11, '83 1¾
Delaware & Raritan* 100	5,847,400	q'rterly.	July 10, '83 2½
Lehigh Coal and Navigation 50	11,273,400	semi-an.	June 6, '83 2½
Monongahela Navigation 50	1,004,500	semi-an.	Jan. 1, '83 $3
Morris, consolidated 100	1,025,000	semi-an.	Feb. 1, '83 2
" preferred 100	1,175,000	semi-an.	Feb. 1, '83 5
Pennsylvania 50	4,501,200	.....	.....
Schuylkill Navigation com.* 50	859,100	semi-an.	June 8, '83 35c.
" " pref. 50	3,200,000	semi-an.	June 8, '83 70c.
MISCELLANEOUS.			
Adams Express 100	12,000,000	q'rterly.	June 1, '83 2
American Express 50	18,000,000	semi-an.	July 2, '83 3
Calumet & Hecla Mining Co. 50	100,000 S.	q'rterly.	May 15, '83 $5
Central Mining Co. 100	.....	annual.	Feb. 15, '83 $3
Consolidation Coal 100	10,250,000	semi-an.	Jan. 27, '82 2
George's Creek Coal & Iron 100	.....	semi-an.	Jan. 1, '83 3
Maryland Coal 100	4,400,000	semi-an.	Feb. 1, '76 1½
Missouri Valley Land Co. 100	200,000	semi-an.	July 1, '83 $10
National Tube Works 100	2,000,000	q'rterly.	July 2, '83 2
Pacific Mail Steamship 100	20,000,000	q'rterly.	May 1, '83 3
Pennsylvania Coal 50	5,000,000	q'rterly.	May 15, '83 2
Pullman Palace Car 100	10,000,000	q'rterly.	May 15, '83 2
Quicksilver, com. 100	5,708,700	.....	May 1, '82 2 0.4
" pref. 100	4,291,300	.....	May 1, '82 6
Quincy Mining Co. 25	40,000 shs	semi-an.	Feb. 15, '83 $6
Quincy Railroad Bridge 100	1,750,000	semi-an.	July 2, '83 8½
Sioux City & Iowa Falls L. & L. Co. 100	500,000	semi-an.	July 1, '83 5
Spring Mountain Coal 100	1,500,000	semi-an.	June 11, '83 3½
Topeka Equipment Co. 100	255,500	semi-an.	Apl. 2, '83 5
United States Express 100	7,000,000	q'rterly	May 1, '83 1
Wells, Fargo & Co. Express 100	6,250,000	semi-an.	July 16, '83 4
Western Union Telegraph 100	80,000,000	q'rterly.	July 16, '83 1¾

Financial and Commercial.

NEW YORK, TUESDAY, July 10, 1883.

CALL loans on stock collaterals during the forenoon were 2½ and 3 per cent.

The posted rates for foreign exchange were 4.85½ and 4.89. The actual rates were as follows: Sixty days, 4.84½@4.84¾; demand, 4.88@4.88¼; cables, 4.88½@4.88¾; commercial bills, 4.83@4.83½.

Continental bills were as follows: Francs, 5.20⅝@5.21¼ and 5.18¾@5.18¾; Reichmarks, 94⅜@94½ and 95@95¼; Guilders, 39¼@40 and 40⅛@40¼.

U. S. 4½s are quoted at 112¾@113; U. S. 4s, 118⅜@119½; U. S. 3s, 103½@103¾; currency 6s, 1885-'99, 127@131.

THE gross earnings of the Lake Shore and Michigan Southern Railway for the half-year ending June 30, 1883, were $9,210,616, the operating expenses and taxes $5,668,779, and the net earnings $3,541,837; from which deduct interest, rentals and dividends on guaranteed stock, amounting to $1,800,000—leaving a balance of $1,741,837, or $3.52 per share. Two dividends of 2 per cent. each have been declared payable May 1 and August 1, amounting to $1,978,660, showing a deficiency of $236,823. Compared with the corresponding period of the previous year, the gross earnings show an increase of $1,257,895, with an increase in operating expenses of $309,103, making the increase in net earnings $948,792. The property is represented as having been kept up to its usual high standard and the cost of doing it has been charged to operating expenses. Nothing has been charged to construction account. If the last half of 1883 yields as good results as the same period of last year ($6.20 per share) the whole year will show an earning of 9⅓ per cent.

The gross earnings of the Michigan Central Railroad for the half-year ending June 30, 1883, were $6,740,000, the operating expenses and taxes $4,591,000, and the net earnings, $2,149,000; from which deduct interest and taxes, $1,210,000—leaving a balance of $939,000, divided (as per traffic agreement) $626,000, or two-thirds to the Michigan Central, and $313,000, or one-third to the Canada Southern. A dividend of 3 per cent. amounting to $562,146, has been declared on the capital stock of the Michigan Central, leaving a surplus to that company of $63,854; and a dividend of 2 per cent., or $300,000, on the capital stock of the Canada Southern, leaving a surplus for the six months of $13,000.

The capital stock of the Arkansas and Louisiana Railroad Company has been increased from $1,200,000 to $2,400,000.

The government of Nova Scotia paid into the Bank of Montreal, on the 30th ult., $500,000 and one month's interest, being a portion of the amount awarded to the Halifax and Cape Breton Railway by the arbitrators, a few weeks since. The balance of $558,000 must be paid within three months. The road is now operated by the company for the government.

During the month of June, 51,367 immigrants landed at Castle Garden against 51,189 in the month of June, 1882. The arrivals during the past six months have been 224,494 against 278,335 during the corresponding six months of 1882, a decrease of 53,841.

The capital stock of the Cape Cod Canal Company has been fixed at $5,000,000.

The mints of the United States coined, during the month of June, 85,742 double-eagles, 65,700 eagles, 2,350,200 standard silver dollars, 200 half-dollars, 200 quarter-dollars, 710,200 dimes, 1,803,000 five-cent pieces, 1,500 three-cent pieces, and 6,102,500 one-cent pieces—a total coinage of 11,119,242 pieces, of a value of $4,944,430. During the fiscal year ended June 30, 1883, the mints coined 1,376,306 double-eagles, 660,379 eagles, 355,072 half-eagles, 1,555 three-dollar pieces, 4,055 quarter-eagles, 8,855 gold dollars, 28,111,119 standard silver dollars, 5,519 half dollars, 16,319 quarter-dollars, 7,175,119 dimes, 20,455,488 five-cent pieces,

28,619 three-cent pieces, and 40,467,400 one-cent pieces—a total coinage of 98,665,824 pieces, of a value of $66,192,704, viz: Gold, 2,406,222 pieces, $35,928,927 value; silver, 35,308,076 pieces, $28,835,470 value; minor, 60,951,526 pieces, $1,428,307 value.

At a meeting of the stockholders of the Cincinnati and Eastern Railroad Company, held in Cincinnati on the 2d inst., the action of the directors authorizing the issue of $2,000,000 of mortgage bonds and contracting for the expenditure of the proceeds was approved.

The total assessment of real and personal property in this city for 1883 is $1,276,677,164—an increase, compared with the previous year, of $43,200,765. Notwithstanding this large increase in values, there is a larger relative increase in expenditures, which will require an increase from $2.25 to $2.27 on the one hundred dollars for municipal expenses. The total funded debt of the city is $130,925,561.69; sinking fund for redemption of debt, $35,535,388.59; net funded debt, $95,390,173.10.

A statement of the funded indebtedness of the District of Columbia and the late corporation of Washington, shows that $1,312,150 of the debt has been retired since July 1, 1878, and a reduction made in annual interest charge of $76,992. The issue of District 3.65s to date is $14,502,650. These bonds are limited by law to $15,000,000. The total funded debt of the District is now $21,553,900. The total District debt on which interest has ceased amounts to $5,340.18.

The official statement of the business of all lines of the Pennsylvania Railroad Company east of Pittsburgh and Erie for May, 1883, as compared with the same month in 1882, shows an increase in gross earnings of $194,129, an increase in expenses of $352,244, and a decrease in net earnings of $158,115. The five months of 1883, as compared with the same period of 1882, show an increase in gross earnings of $1,638,617, an increase in expenses of $954,722, and a decrease in net earnings of $683,895. All lines west of Pittsburgh and Erie for the five months of 1883, show a surplus over all liabilities of $351,291, being a gain as compared with the same period of 1882, of $419,606.

The gross earnings of the Philadelphia and Erie Railroad for May, 1883, were $363,359.41, the expenses $226,938.40, and the net earnings $136,421.01; net earnings 1882, $128,780.14—increase, $7,640.87. Net earnings for five months of 1883, $571,650.11; net earnings for five months of 1882, $446,202.78—increase, $125,446.33.

The gross earnings of the Northern Central Railway for May, 1883, were $499,132, the expenses $287,056, and the net earnings $212,076, an increase as compared with the month of May last year of $33,100. The net earnings for the five months of 1883 were $899,309, an increase as compared with the corresponding period last year of $235,344.

The interest-bearing debt of the United States, June 30, 1883, is $1,338,229,150; debt on which interest has ceased since maturity, $7,831,415.26; debt bearing no interest, $538,111,162.81; interest, $12,309,382.33—total debt and interest, $1,896,481,110.40. Of the debt bearing interest, $32,082,600 are bonds bearing interest at five per cent., continued at three and one-half per cent.; $250,000,000 at four and one-half per cent.; $737,586,300 at four per cent.; $304,204,350 at three per cent.; $355,900 refunding certificates, four per cent.: $14,000,000 Navy Pension Fund, four per cent. The debt bearing no interest consists of: Old demand and legal tender notes, $346,740,001; certificates of deposit, $13,375,000; gold and silver certificates, $170,995,471; fractional currency, $7,000,690.81. The cash in the treasury amounts to $345,389,902.92; and the total debt, less cash in treasury, to $1,551,091,207.48, against $1,569,189,408.91 on the first of June, 1883, a decrease during the month of $18,098,201.43, and a decrease since the 30th of June, 1882, of $137,823,253.24. The cash balance available, July 1, 1883, amounts to $151,118,346.54.

Proposed Sale of the Hoosac Tunnel.

The Railroad Committee of the Senate of Massachusetts have reported a bill which provides for the sale of the forty-four miles of railroad, including the Hoosac Tunnel, now owned by the State. Certain capitalists wishing to buy said piece of road, with the view to form a consolidated line of railway to the West, by connecting with the New York, West Shore and Buffalo, at a point about two hundred miles from Boston, the bill was drawn in their behalf. The subsequent inquiry developed strong reasons in its favor. A railroad commissioner of the State stated that he and his fellow commissioners favored the proposed change. It was further said during the inquiry, that under the law of the State, all railroads connected with the tunnel can run through it just as many locomotives as they please, without let or hindrance from its manager. The consequence is that the number of accidents taking place on the piece of road owned by the government, is larger than on all the railways beside, throughout the State. Moreover, by reason of this distinguishing redundancy of mishaps, and from other causes, the income derived by the State from its ownership of the section of line in question, is just about nothing. On the other hand, the sale of the property at four million dollars—the minimum price mentioned—would yield to the seller an income of two hundred thousand dollars a year. These powerful reasons for the change proposed in the bill are met with force by the Boston *Journal*, and other intelligent organs of opinion. The *Journal* proposes that the bill should go over to the next legislature. It considers the matter of sale, and the price obtained, as the least important of the considerations in dealing with the question. The inquiry should be, what would be the effect of the sale of the property upon the business and prosperity of Massachusetts? A mistake in the transfer of its ownership could easily jeopardize the interests involved in the fact that the tunnel is the gateway between the State and the great West, and through it must pass a large proportion of the production of the State to its market, and also a large part of the products of the West for Massachusetts, the states to the East, and for Europe, if Massachusetts is to have a foreign trade? The *Journal* continues thus: "A half-dozen competing railways desire to use this line, and must use it if the State is to realize the most for its large expenditure. Suppose that the Tunnel line should fall into the hands of one of these rival companies—what then? The others would not be likely to receive all the advantages which the one line controlling the tunnel would obtain. This would control the business of the other roads. Again, suppose that the Tunnel line should fall into the hands of a company which would fix rates which would put Boston out of the ports that can compete for foreign trade, the result of the sale would be in the nature of a disaster to Boston." The thorough discussion which is given the bill providing for the sale of the Hoosac Tunnel, does credit to the intelligence and sagacity of the people of the Bay State.

Our Canadian friends have reason for pride and thankfulness in an improvement introduced by the Canada Atlantic Railway on the third instant. The distance from Ottawa to Montreal is 116 miles, previously covered in about three hours and three-quarters, at the best. Now the morning train leaving Ottawa at 8.35 arrives in Montreal at 11.35; and the evening express from Montreal to Ottawa makes the same speed, reaching the latter city at 7.35. This splendid service is practicable because the rolling-stock and road-bed of the Canada Atlantic are in perfect condition.

The Ohio Falls Car Company, at Jeffersonville, Ind., are building ten passenger coaches for the Louisville and Nashville road, to meet the requirements of travel incident to the Southern Exposition at Louisville, in August next.

RAILROAD MEDICAL SERVICE.

(CONTINUED.)

BY S. S. HERRICK, M. D.

SECRETARY BOARD OF HEALTH, STATE OF LOUISIANA.

THE SWEDISH SYSTEM.

For information on this particular subject, I am indebted to the U. S. Consul at Stockholm, Nere A. Elfwing, Esq., who was aided in answering my inquiries by the Director General of the Railways of Sweden.

On the government railways there is generally a physician for every fifty-two kilometres of the line of road, and forty-four physicians altogether are thus employed upon the government roads. The private railways have a medical service closely resembling this system. One of the duties of the medical men is to examine all applicants for employment, and those found laboring under any physical disability such as to disqualify them for duty are rejected. Particular attention is paid to color-blindness and other defects of sight and hearing among those engaged in the movement of trains. They are also required to give their professional services to all those who are entitled to the same.

Relief is granted to the following: 1. All those injured by accidents upon the lines; 2. In ordinary sickness, to regular employés and their families; 3. To other employés while in actual service; 4. To laborers in the shops, who have paid the same contribution as is required of those in the operating department, and also to their families; 5. To extra laborers who fall sick or are injured while on duty. All the above are also entitled to medicines, at the expense of the company, while under medical treatment. No exception is made against those who have contracted injury or disease by their own fault, as in case of drunkenness, brawls or venereal infection.

Railroads have no special hospitals of their own, but have contracts with the civil hospitals for the admission of suitable cases. There subsistence is provided, as well as attendance and medicines; and patients are placed in separate rooms or in common wards according to the nature of the case, at the discretion of the physician. Artificial limbs and trusses are provided at the expense of the company, for one occasion, to those who require them for injury received in its service.

Payment of wages is continued to those disabled for service under the following specifications: 1. Full pay for those suffering from injury in the company's service, whether the individual is attended at hospital or in private; 2. For an ordinary employé in sickness, full pay for a period not exceeding sixty days during the same year, and beyond that time four-fifths to those whose annual salary is more than $325, or five-sixths to those receiving less; 3. For a clerk at a salary more than $325 per annum, four-fifths of his full pay, or five-sixths if the salary amounts to less than $325; 4. Clerks and employés attended in hospitals are entitled to half pay; 5. Extra employés and laborers who are entitled to medical relief, but do not receive it at hospital, receive an allowance of fifty cents a day during sickness. The above allowances are limited to two months, except when specially ordered by the management after hearing a report of the case.

In addition to the reports required by the railroad company, medical officers are directed to report annually to the Royal Board of Health, and to conform to the royal edicts relative to infectious diseases. They are also required to give attention to the personal hygiene of employés, and to the sanitary condition of railroad carriages, buildings, grounds, etc.

I am informed that provision is made for relief of the families of employés in case of sickness, injury or death, both by the company and by independent associations among the men themselves; but particulars have not been furnished. It appears that the men have to make regular contributions, but I am not informed to what amount.

Express trains carry supplies of medicines and surgical appliances, for use in case of accident or other emergency on the route.

Cars used for transporting live-stock are always thoroughly cleansed after their discharge. It is stated, "Disinfection has only once been needed in twenty-five years;" which indicates the total absence of glanders, bovine pest and other infectious diseases among animals in Sweden.

It is apparent, therefore, that the medical service of the Swedish railways is wisely designed, thoroughly organized, and no doubt highly efficient. Its natural results are a high state of physical health and aptitude among employés, and their general contentment and permanence in their engagements.

SPAIN.

Through the kindness of the Chargé d'Affaires *ad interim* of the U. S. Legation at Madrid, Dwight T. Reed, Esq., I have received particulars of the medical service upon the two most important railroad systems of Spain. The chief surgeon of the Madrid, Zaragosa and Alicante Railroad, Dr. R. Carrion, has made a careful report upon the points covered by my circular of inquiries, of which the following is the substance:

The lines are divided into a suitable number of sections, each one of which is supplied with a medical officer; and all these officers are under the general direction of a chief, who is assisted at the central office by a secretary and several clerks. The number of sections and their limits are liable to change, according to the nature or exigencies of the service; and in some instances the section-physician is furnished with one or more assistants. The physicians are divided into three classes, according to seniority and experience in the service, and their salaries vary in like order. The usual period of service is five years in the first class ("entrado"), three years in the second ("ascenso"), after which they belong to the third class ("termino"). Extraordinary services or unusual aptitude may bring more rapid promotion. Each physician, in addition to a specified salary, has a certain monthly allowance for traveling and office expenses.

The district physicians are required to attend all individuals injured by railroad accidents, whether travelers or employés; to wait upon all employés in their ordinary illness, and also members of their families in cases hereafter to be noted; to make physical examinations of all persons who apply for employment under the company; to inspect, as often as necessary, all the establishments of the company, with reference to their sanitary condition; to keep a register of all cases treated, and record of other duties performed, and to report regularly to the surgeon-in-chief; to assist the other branches of railway service in all questions of a hygienic or medico-legal character, and particularly the legal department in adjusting claims for compensation for injuries suffered by railroad accidents.

While it is the privilege of employés to have private physicians at their own expense, the company's physician must keep himself informed of the nature and progress of the complaint, and report accordingly.

Employés are not entitled to medical relief from the company, if their illness was contracted when they were off duty, nor to those suffering from chronic diseases before entering the company's service, or those whose complaints are due to venereal affections, drunkenness or disorderly conduct. Besides, their pay is stopped during the period of disability. Artisans and laborers engaged by builders and contractors apart from the administration, are not entitled to medical relief; but as a rule receive a first visit from the section-surgeon, whenever they fall sick or are injured while at work.

The families of employés receive medical relief, when their illness is clearly traceable to local insanitary causes connected with residence along the railroad line; also when remote from private physicians.

Medicines and surgical appliances are not furnished to those employés whose annual pay exceeds 1,250 pesetas ($250).

The medical service is sustained altogether at the expense of the company, without reserving any portion of the monthly wages of employés. It has no hospital of its own, and no contract with civil hospitals, but allows its people to go to such establishments at their own expense or that of the hospital.

The company has provided a number of *relief-chests*, containing medicines, surgical instruments and appliances for dressing injuries. These are deposited at certain important stations, and carried on the ambulance cars, as required by law. The section physicians also are provided with similar boxes, and with such drugs and medicines as their duties require. Every passenger train carries a relief-box (*botequin de tren*), and the kind adopted by this company contains materials for treating thirty-seven specified medical complaints, six varieties of fracture and twenty simple injuries. The box, therefore, is calculated to meet the requirements of sixty-three different emergencies, such as are most liable to happen upon a railroad train.

In case of sickness or other domestic affliction, the company will advance money for the relief of the family of an employé, with the obligation on his part for its return by subsequent deductions from his pay. On the death of an employé, pecuniary relief is granted to his family, based upon the length of his service, his fidelity and the number of children left fatherless. This is not done according to fixed rules, but each case is considered on its own merits. When the death was due to some ordinary disease, an allowance is granted not exceeding three months' wages; but when due to malarial fever or other malady incident to duty, the allowance is equal to pay for three to five months. The same donation is made to an employé disabled in the company's service, but the right is reserved to increase or diminish it according to circumstances. If the disability is only partial, the sufferer is given such employment as suits his case, whenever opportunity offers.

In 1873 the company established a Provident Fund, for the benefit of the whole body of employés, as a simple gratuity. An employé who has attained sixty years of age and served the company not less than five years, enjoys a full participation in this fund, and its privileges ensue to his widow and legitimate heirs on his death. In case of total physical disability, the same benefit accrues to the employé himself. Moreover, anyone who has fulfilled seventeen years of service is entitled to half of his due participation, on application for the same, without regard to his state of health. The capital of this fund is formed by annual donations by the company, and the accrued interest on its bonds, in which the donations are invested.

There is also an independent relief association, founded by the employés themselves in 1880, upon the following plan: Candidates for membership must be in good health and less than fifty-four years of age. The initiation fee is three pesetas (sixty cents), and the monthly due fifty centimos (ten cents). Whenever a member dies or is disabled, the other contributors are assessed not less than fifty centimos each, and may voluntarily contribute more. Relief is granted once only, payable to the widow and children or nearest legal heirs, in case of death, and in case of disablement, to the member himself. The sum payable consists (1) of double the amount of his monthly payments since becoming a member, together with (2) the final assessments of the surviving members. This association also advances money to members in distress, not exceeding 150 pesetas ($30) or one month's wages, upon an obligation to return the loan by monthly deductions from their pay. The capital of the association is derived (1) from initiation fees, (2) from monthly dues, and (3) from the profits of public entertainments. The board of directors is elected by the members, and the administrative officers serve without pay. The constitution of the association provides that, when the capital shall have become sufficient, pecuniary relief may be granted to sick members, and an infirmary be erected for the accommodation of themselves and their families.

As already intimated, all applicants for employment by the Madrid, Zaragosa and Alicante Railroad must undergo a medical examination by some section-physician, who forwards a certificate of its result to the chief medical officer. Each physician is provided, for his guidance, with a list of infirmities, injuries and deformities, which are settled as absolute or relative disqualifications for service; that is, some of which totally disqualify for all kinds of duty, and others for certain positions.

Regulations relative to transportation of live-stock merely limit the number of animals to be carried in each car. Six horses, eight horned cattle or mules, and fifteen calves or asses are allowed to each car. Twenty-two hogs are allowed to each floor of a car, when their weight exceeds eighty kilograms each; and thirty hogs when the weight is less, or eighty young pigs. On each floor sixty sheep or goats and eighty lambs are allowed. The shipper may, at his own risk, transport larger numbers, provided no car shall carry a heavier burden than its own weight. Nothing is said of regulations to prevent too long confinement of animals in cars, with consequent deprivation of food and water; but it is not improbable that these points are covered by legal enactments.

A similar, but briefer, report has been received, through the same channel, upon the medical service of the Northern Railway Company of Spain. It differs only in some minor features from the foregoing, as thus appears: Each section of the lines has an auxiliary or supernumerary physician, who receives no regular salary. The families of employés are not entitled to medical attendance nor medicines from the company. In case of accident, disease or death of an employé, his family receive pecuniary relief, half of which is furnished by the company and half from the Relief Fund. Every employé is required to contribute one-half per cent of his wages to this fund. There are no rules relative to transportation of live animals. Whenever stock-cars are supposed to be infected, special orders are given for their disinfection.

Such is the enlightened plan of medical service for the railways leading out of Madrid. On the other hand, I am informed by the U. S. Consul at Barcelona that the railroads of Spain have no medical service at all. Evidently he is able to speak only for those lines which enter that city. It is, however, noteworthy that Mr. Bauer, the principal proprietor of the Southern railway system (Madrid, Zaragosa and Alicante), and Mr. Polack, director of the Northern system, both have Teutonic names, suggestive of ideas transplanted from Teutonic to Iberian soil.

[TO BE CONTINUED.]

Color-Blindness.

THE *Railway Review* has just issued an important pamphlet entitled "Control of Defective Vision on Land and Sea; with especial reference to the subject of color-blindness; a resumé of what has been done toward arriving at proper legislative action."

Without entering into technical discussions of the subject, this work gives a full account of the present state of this important agitation. As a supplement to Dr. Jeffries' celebrated work on color-blindness it is invaluable. It should be read not only by all railway men, but by the entire traveling public. It furnishes a guide to proper legislative and corporate action. There is no longer any excuse for ignorance on this subject. The *Railway Review* will send this pamphlet, postpaid, on receipt of twenty-five cents.

ENGINEERS Roebling, Martin and Collingwood, the three chief bridge engineers, all graduated at Rensselaer Polytechnic Institute, Troy.

Varnish.

How many, in looking at a handsomely varnished surface, stop to think that the varnish has other uses than that of imparting a fine finish. Few, we imagine, give it a second thought, so accustomed are they to seeing the lustrous, mirror-like surface of carriages and coaches; hence the curiosity which at first may have been excited, and the wonder as to how such results could be obtained soon become dulled by every-day contact with the mystery.

We say mystery, and perhaps rightly so, for is there anything more common, and yet so little understood? The class who have been initiated into the mysteries of the process by which the result is obtained, is comparatively small.

What is varnish? Most of us have seen it, and know it to be a clear, limpid fluid. The degree of transparency or paleness is one of the means of determining the grade or quality of it. A fine syrup has much the appearance of a good varnish. The word varnish covers a very wide field, as the term in its fullest sense can embrace all the thousand and one preparations compounded for as many different purposes, but we shall refer only to one branch, that of varnishes for coach and car work, as it is here that the highest perfection is reached, and the greatest skill and intelligence are required in manufacturing.

The three principal ingredients used are Copal Gum, Linseed Oil, and Spirits Turpentine. The nature of the two last named articles is generally known, owing to their commonness, Linseed Oil being the oil obtained by pressure from flaxseed, the grade or quality of which depends upon the locality where the seed is grown. Turpentine is a resinous substance, exuding from various species of trees; that which is used in the manufacture of varnish is almost entirely from pines; the Southern States—the Carolinas, Georgia and Alabama—furnishing the greater part. But the other article, Gum Copal, is more of a stranger. Gum Animi, or Zanzibar gum, (the latter term denoting that it comes from the island of Zanzibar, which lies just off the eastern coast of Africa), is the clearest and hardest of all the Copal gums, and is used in the finest grades of varnishes. It can be distinguished by its rough or "goose-skinned" surface. Benguela gum, from the western coast of Africa, ranks next in commercial value. Kauri gum comes from New Zealand; it is a less expensive gum, and is largely used in the lower grades of varnishes. These gums are dug from the sand by natives, and sold to merchants, by whom they are assorted, graded and prepared for the market. Beautiful specimens of gum are frequently found, which contain insects and leaves imbedded in them, oftentimes of species long since extinct.

Professor W. D. Gunning makes the following interesting comments on this part of the subject:

"We no longer wonder how the insect got into the copal, but how long it has been there. We have no data by which we can fix the time, but we know enough to assure us that it must be reckoned by thousands of years. The revolutions of nature from forest to desert, are never achieved in a day. The crimes of men have 'dried up realms to deserts.' Nature has done the same, but she is never a swift architect of ruin. To have wrought the extinction of a race of trees from Africa, and buried the soil which bore them eighty feet under the sand, must have required many ages.

"The fly or moth which looks as if it had just lit in its crystal coffin, may have been there a hundred thousand years.

"We are sure that it was there, just as you see it to-day, long before there was any man upon the earth."

Almost any encyclopedia will give the constituent parts of varnish, but the *art* of making good varnish is not found in type, and can only be learned by patient, painstaking effort and intelligence.

An essential quality of varnish is that it must harden without losing its transparency, as it must not change the colors it is intended to preserve. It must exclude the action of air, because wood and metals are varnished to protect them from rust and decay. It must also be water-proof, else the effect of the varnish would not be permanent. And a point of primary importance is that it must possess durability.

In combining its various ingredients so that the varnish will answer these requirements, and at the same time work freely under the brush, lies the secret and mystery of varnish-making, and he who best succeeds in accomplishing it confers upon the world a blessing, and upon himself a fortune.

Let us look at a carriage and observe the brilliant surface—smooth as a mirror, and like it, reflecting one's features, though possibly somewhat distorted by a concave or convex panel, as the case may be. The luster appears to have considerable depth, yet we know that it is but slightly removed from the bare wood. Would you suppose that fifteen or sixteen separate coats had been put on to attain this? beginning with the priming or first coat, and following it with various layers, each successive coat suited for its special purpose in this out-growing process; all must be perfect, else the finished job will suffer, for one coat cannot remedy the defects of another. It is this unity of coats and the skill required in laying them, which place carriage-building among the arts, for are not artistic taste, talent and skill all called into play in the production of a carriage of the highest class? Would you criticise one for calling a Brewster-wagon a work of art?

The first varnish made in the United States was at Cambridge, Mass., in the year 1820. It is claimed that prior to that time, some few were accustomed to itinerate over the country, mixing small quantities of varnish in shops where their services were required, but not until the year 1820 was it begun as a regular business, and made for general sale. The manufacturing was begun in a blacksmith shop, and on such a small scale that only a portion of the shop was used, a single kettle for boiling answering all requirements.

This blacksmith shop, or rather the history of it, for the shop was destroyed by fire about 1865, is interesting, apart from the interest naturally belonging to it as the commencement of an industry which was destined to become a great branch of trade, as it was this very shop which Longfellow mentions in his well-known poem, "The Village Blacksmith."

Only those acquainted with the varnish business sufficiently well to give them an insight into its ramifications, understand the magnitude of the trade, and the immense amount of capital engaged in it. From an infant industry it has grown to wonderful proportions; new uses are constantly being found for varnish, by which it embellishes the article to which it is applied, affords satisfaction to the buyer, and profit to the manufacturer. For it is a truism, that whatever adds to the appearance, whether in animate or inanimate nature, whether the addition comes from "a grace snatched beyond the rules of art" or otherwise, increases the pleasing power of the one, and the selling power of the other in a corresponding degree. Art, which in one sense is synonymous with excellence, is entering more and more into the various mechanical pursuits, and the future will reveal a more decided advance than has yet been accomplished.

Charles Howard.

New Orleans is very properly congratulating herself on her increasing prominence as a grain exporting port. For the past month, the shipments of grain amounted to 1,317,549 bushels, and for the entire season the receipts there have amounted to 11,732,250 bushels, against 3,640,465 bushels last year, an increase of 218 per cent. Owing to the high water prevailing in the Mississippi at present, the *Times-Democrat* is of the opinion that the grain business of the port will continue late into the summer. There is, it adds, every reason to hope that this river route will not be closed at all to boats and barges this year by low water.

Economy in the Painting of Passenger Cars and Locomotives.

BY A VETERAN.

THE painting of a first-class railway coach is quite an expensive piece of work. "And why so expensive?" you ask. The reply is contained in the following paragraphs: To begin with the raw material, we find that much of the ash, whitewood, etc., used in the frame and panels of the car, is wet or unseasoned; or that workmen who should have a better knowledge of their trade will wet seasoned wood, to swell the grain over brad-holes and screw-holes, in order, as they say, "to partially close over the heads of brads, nails or screws, so that less putty will be required to cover them." The moisture, thus introduced, has not evaporated when they call the painters to paint the work. This sealing up of dampness is but one little devil among the many shall name which create expense.

The painter, although perhaps a good workman, is usually devoid of chemical knowledge, so requisite in the selection of painters' materials, which would enable him at once to determine by inspection, or by analysis, if need be, the nature and properties of the pigment and vehicle which have been selected for him by a purchasing agent or contractor; and he therefore goes at his work blindly, hoping that everything is right, and for aught he knows (and such is often the fact), he besmears panel, frame and stanchion with, it may be, a mixture of barytes and fish oil, cunningly prepared so as to counterfeit an article of real worth. Who knows, when the paint is spread, what its properties are? It looks all right, and they who see it believe it is right. Dash is a good workman. He ought to know! But Mr. Dash may not know; and if he does, he may not let his tongue wag against his bread and butter. Thus the car is *primed*. Had the material, when purchased, been carefully inspected by a competent chemist or expert, engaged for such work, a good result could have been vouched for, but not otherwise.

Again, the employment of an old (and it ought to be obsolete) method of filling the pores of the wood with oil and lead, is another drawback. The trade journals nowadays are teeming with testimonials as to the merits of liquid primings or fillers, (some of which have borne the test of years of trial and experiment) as substitutes for oil and lead, or oil alone. These primings are not a thing of to-day, years have rolled by since the first was introduced, and the finest carriages built in the world, are to-day, and for many years past have been primed with them, over all their parts, and that too with the most satisfactory results.

The priming on and dry, the next coating, of similar material to the first is applied, after the surface has been rubbed, with sandpaper, just enough to open up a new raw and porous surface; for every small grain of lead, touched by the sandpaper, becomes a little hill of dry chalk, ready to suck in its fill of oil from the succeeding coat. Thus the sandpaper proves to be another little devil.

The rough-stuff coats follow, perhaps, and when they have been applied the chemists' knowledge is required to determine what pigment to use, and with what vehicles to mix it. If the pigment be of such a chemical nature as to destroy a portion of the oil used, as would be the case if it contained a strong oxide of iron and manganese, then it should not be found upon a railway car or upon any other job of painting. If it be of such a nature as to require a large portion of lead in mixing, it will not answer, for the rough-stuff must dry moderately quick, and the necessary quantity of dryers to effect such drying, would tend to neutralize the oil or varnish with which the paint was mixed, and leave the lead a dry, crumbling substance where a solid bed of paint was required. Another imp is thus enlisted. The rubbing out of roughstuff passes along slowly, the job is washed, dried off with "shammy" and, possibly, a coat of paint is put on within the hour after the stone left the surface. Another mass of moisture sealed up under the paint, another imp dancing around the car. It matters not what *color* may be employed, light or dark, the result is the same. The work of destruction will go on as readily with one as the other. Many a cloven foot could be discovered in the *color* by an expert, could he but see all that occurred during the coloring, or have an opportunity to analyze the paints, if ready-prepared. Can we look for progress, or a reduction of expenses when such things exist? Every car-shop should have a person thoroughly qualified to prepare the paints, and who would look well to it that they were not tampered with after leaving his hands.

Color-and-varnish follows in direct order; and here there is opportunity for the skill of the chemist, for even the best varnish mixed with poor paint or pigment will give trouble, such as "pitting," "crawling," "enameling," "wrinkling," etc. However, in car painting there is not so much chance for "deviltries" as the carriage painter encounters, for cars are not so likely to be colored in the same manner; that is, instead of using pure lakes, for example, to color a panel, and which in many cases hold a large percentage of alum or alkali—used in their manufacture—the car painter will use a mixture of pigments to produce a dark color, as for instance, that known as the "Pullman color," into which but little lake enters.

Varnishing may be done in an economical manner or otherwise. Much time may be given for rubbing coats to harden, and then much time be spent in rubbing and preparing for the finishing coats. The aim should be to save time in doing the work, so that the varnish on a car may harden well before it is run on the road. The old-fashioned plan of giving from four to seven days for the drying of each coat is no longer necessary, and the "repeating process" is now practiced in many shops, while in England some of the best carriage painters finish their work by "varnishing on the tack" as they call it.

The application of two or more coats of a well-known finishing varnish, with no further preparation than a simple washing, will insure greater durability than is attained where rubbing is practiced, and those who seek for durability will thus gain economy in their work as well.

PAINTING LOCOMOTIVES.

There is, no doubt, as great a chance to economize in the painting of locomotives as in doing the work on the cars, for in painting locomotives the aim is not so much elegance and a brilliant finish as durability. No matter how well finished a locomotive may be, the beauty or luster remains but for a short time, owing to the hard usage and particularly the excessive heat that it is subjected to. Rust on the iron, and grease or oil over all parts, are sorry things for the painter to encounter, and to resist the former and destroy the latter, should be the earnest purpose of the workman.

To guard against rust of the tank and other irons, instead of priming with boiled oil, as many do, let the painter use upon a new job, or one well cleaned, permanent wood filling, which is a well-known anti-damp, and possesses the greatest tenacity of any known liquid primer. He will thereby establish at once a foundation that will hold up the paint, and it will be a long time before rust will form under the pellicle which covers the iron. The tank may be filled or roughstuffed with one-half dry lead and one-half metallic paint, if desired, or with the ready prepared roughstuff, and after it has been rubbed out, a second coat of the permanent wood filling should be applied and well rubbed over with rags. This coating closes up the pores of the roughstuff and aids in keeping out moisture.

It is poor economy not to paint a locomotive well; no matter about extra ornamentation, perhaps, but let there be a good substance of paint and varnish on it, even if it be an egg-shell gloss, for the smoother and neater the engine, the more pride will the engineer or fireman take to "keep her bright and nice." The oily waste with which the varnished parts are rubbed adds durability, for the oil soaks in and supplies the waste which is ever going on in varnish, exposed as it is upon a locomotive, to the constant presence of carbonic acid gas, sulphur, ammonia, etc.

Tramway.

[This department of the AMERICAN RAILROAD JOURNAL is devoted to the interests of Street Railways; and communications, suggestions and items of information relative to their organization, management and appliances are solicited by the editors. All communications should be accompanied by the name and address of the writer. The English nomenclature of "Tramway" is adopted in this department as being of greater convenience and more specific in its meaning than "street railway," though in allusion to individual organizations we shall preserve their corporate titles. It is our hope to nationalize the term Tramway, which is now generally used in every English speaking territory with the exception of the United States.]

Compressed Air Engines for Tramways.

THE application of compressed air to the driving of tram-cars has been successfully demonstrated in England to a large party of gentlemen interested in the subject, the occasion being the trial by the British Mékarski Air Engine Company (Limited) of one of their air engines on the King's-cross and Holloway line of the London Street Tramways. The car which had been fitted up with the Mékarski apparatus was charged with compressed air in the company's stables at Holloway, the pressure in the reservoirs, extending under the platform or floor of the car, being that of thirty atmospheres, or 450 lbs. to the square inch. Two wheels are used in driving the car, the cylinders being five and one-quarter inches in diameter, and having a ten inch stroke. The air, in passing from the reservoirs to the cylinders, bubbles through boiling water and steam of sixty pounds pressure on the inch. This process not only expands the air, but prevents the formation of snow in the cylinders and at the exhaust; moreover, the moisture absorbed by the air acts as a lubricant for the side valves and pistons. The boiling water and steam are contained in a vessel styled a "hot-pot," which, with its regulating valve, is at either end of the car, to enable the vehicle to be driven either way; but if the local authorities permit an arrangement for turning the car at either end of the line, this duplication will be unnecessary. The apparatus under the car, as well as the wheels, is covered in. The working pressure varies from 120 lbs. to 50 lbs. per square inch; the regulating valve consisting essentially of a piston, which, by means of a hand-wheel and screw, is forced into or raised from a vessel in which water and air are contained. The bottom of this vessel is made of an india-rubber diaphragm, the diaphragm being connected with a valve opening against the pressure of steam and air in the hot-pot. With this arrangement, when the piston is forced down into the vessel in which the water is contained, the diapbragm is pressed downwards, and the valve is opened, allowing the steam and air to escape from the hot-pot to the working cylinders. This valve gives the driver a most delicate and beautiful means of varying the pressure, and it is, in addition, automatically regulating. One of the hot-pots, with its regulating valve upon it, has been placed at each end of the car, and means for ingress and egress of passengers is provided; so that, when the end of the journey is reached, the driver takes his reversing handle, and the wheel of the regulating valve, to the opposite end of the car with him, and the conductor changes ends as in the ordinary horse-car. No noise is made with the exhaust of the engines; there is no steam visible, neither is there any smell of fire, or of hot oil or other lubricant for the engines.

Some adaptation has been necessary in the application of the Mékarski system to English tram-cars. Certain modifications were necessary to enable it to fulfill the conditions imposed by the Board of Trade on mechanical traction for passenger tramways in England. Amongst other requirements is the provision of a governor, which, when the car exceeds a speed of ten miles an hour, not only cuts off the steam, or rather the air, from the engines working it, but puts on the brakes. There are other ways of stopping the car. The driver can, from either end, put on the air pressure brake, and he has a foot brake which is continually under his control when the car is in motion, and with which ordinary passenger stops are made. This new method of driving tram-cars will not import any fresh danger into the public thoroughfares As already stated, a governor will prevent the speed exceeding a maximum of ten miles, but, of course, the vehicle will travel at a less rate, indeed at the ordinary rate of horsed-cars; but even when running at its greatest speed the car can be brought to rest in a distance slightly exceeding its own length. The driver also has the power by reversing the engines, of rapidly coming to a standstill. It is noteworthy that in the trial trip to and fro on the line, passing horses were not put out of the even tenor of their way by the new conveyance. Nor is there any danger of an explosion from the compressed atmosphere under the car. Mr. T. Harris, the assistant of Sir Frederick Bramwell, C.E., who is the engineer of the Mékarski Company, states that even if by an accident, assumed for the sake of argument, but in practice all but impossible, the condensed air should be in excess of a pressure of thirty atmospheres, the result would not be an explosion by any means, but every joint and rivet of the reservoirs would become a safety-valve to relieve the pressure, and the only result offensive to passengers would be a loud hissing noise. During the four years the system has been in operation at Nantes, with a daily service of fifteen hours, there has not occurred a single hitch. The car as constructed is licensed to carry thirty-eight passengers, which, with the driver and conductor, will make forty people in all. It weighs about six and a half tons unloaded, and would, under favorable conditions, run a distance of from eight to ten miles without recharging. As soon as the sanction of the police authorities is obtained, the new car will be put on service, and in a short time all the cars on the line will be propelled by air-engines. It should be mentioned that the Mékarski engine has been in use in the streets of Nantes for the last four years.

Railways in Paris.

THE committee on the proposed Metropolitan Railway for Paris has just submitted its report to the Municipal Council. It proposes that the scheme, as now amended, should without delay be forwarded to the Minister of Public Works for examination by the Board of Works and the Council of State, and that a bill should be passed through Parliament authorizing the necessary appropriation. The company to which the concession will be made over will have to construct two lines, one from the Arc de Triomphe to the Lyons station, and another from north to south, from and to points which have not yet been fixed. Plans must be sent in within six months from the date of the act, and the work will have to be completed within three years of the approval of the plans. When the railway yields 7 per cent. to its shareholders, a fourth of the surplus will go to the grantees, and the remaining three-fourths will be applied to the reduction of fares, or any other purpose to be determined on by the municipality. The grantees will have full liberty in the choice of the mode of traction. There will be two classes, one at thirty cents and the other at fifteen cents, whatever the distance, with an option to the grantees to start first a class at fifty cents. The company will have to work also a slow and an express goods service.

Caring for Harness.

THIS is one of the seasons of the year when every person using a harness should see that it is properly cleaned and oiled, to secure its durability. If this were done there would be a great saving in the wear of it as well as in the comfort of the horse, which above all other things should receive the best of attention. There are many farmers who get a new harness and wear it out in a short time, just for the want of a few good oilings. The more it is used in mud and rain, the more care it should have. To clean a

harness, take a small tub of lukewarm water, dissolve about two ounces of sal soda and when your harness soaks a short time you can make quick work of it with a stiff scrub-brush. When almost dry, use good oil freely.

Awards at Chicago.

THE awards made at the National Exposition of Railway Appliances, Chicago, include the following in the department of Street Railway Appliances:

Best iron wheel, silver medal—Baltimore Car Wheel Co.
" Car, gold medal—J. G. Brill & Co.
" Car spring, silver medal—French Spiral Spring Co.
" Draw spring, bronze medal—French Spiral Spring Co.
" Bell cord and fixtures complete, bronze medal—John Stephenson Co. (Limited).
" Fare box, silver medal—J. B. Slawson.
" End lamp, bronze medal—John Stephenson Co. (Limited).
" Hand rail bracket, bronze medal—John Stephenson Co. (Limited).
" Journal bearing, bronze medal—John Stephenson Co. (Limited).
" Door locks, bronze medal—John Stephenson Co. (Limited).
" Registering punch, bronze medal—Beadle & Courtney.
" Registering device, bronze medal—E. Chesterman, "Portable."
" Sheave for sliding door, bronze medal—John Stephenson Co. (Limited).
" Door handle, bronze medal—John Stephenson Co. (Limited).
" Life guard, silver medal—John Stephenson Co. (Limited).
" Street car truck, silver medal—Suspension Car Truck Company.
" Street car switch, bronze medal—A. L. Johnson.
" Street car turn table, silver medal—Wm. Wharton, Jr. & Company.
" Street car crossing, silver medal—Wm. Wharton, Jr., & Company.
" Stationary registering device, silver medal—Lewis & Fowler.
" Street car axle box, silver medal—John Stephenson Co. (Limited).

TRAMWAY NOTES.

THE charters of three of the Chicago street railways expire by limitation during the present year, and, under the original grant, the city has a right to purchase the roads at their appraised value. The proposed renewal of the charters has provoked wide discussion, and a proposition has been made by ten capitalists to advance the money for the purchase of the roads, and to pay into the city treasury, annually, ten per cent. of the gross revenue. The street railway officials deny that such a proposition can be, or has been made. Their supposed willingness to cede the right of the city to revenue from them is shown in an ordinance submitted to the council, recently, that they should pay as yearly licenses, $50 on each car operated, on condition that the charters are renewed for twenty years. The ordinance was referred.

THE Union Passenger Railway Company, Philadelphia, will begin the construction of a cable road on Columbia avenue, Franklin, Seventh and Ninth streets about the middle of July. The plans have been completed, and it is the intention to push the work vigorously, so as to have as much finished as possible before the cold weather sets in next winter. The road will be laid in sections, so that only a small portion of each street will be torn up at a time. The iron tubes are now being cast. The engineer in charge has devised a scheme which will obviate the noise that is made by the movement of the wheels when the cable passes over them.

TRAMWAYS have increased in England alone from ninety-four miles in 1876, to 444 in June, 1882, and the capital invested from £1,250,000 to £6,500,000. In June, 1882, the total length in the United Kingdom was 564 miles, 150 of which belonged to local boards, under the authorization of the enabling law of 1860. London has only seventy miles of tramway, not as many as Rio de Janeiro; Bristol, twelve; Liverpool, thirteen, and Manchester and neighborhood, over forty-two miles. The working expenses absorb seventy to eighty per cent., owing largely to the paving expenses, and the net revenue hardly reaches five per cent.

THE number of the car and conductor cannot be too prominently indicated. We observe that on some lines the figures are painted in large characters at both ends of the car. Whatever may be thought of this plan from the æsthetic point of view, its value in keeping the conductor on his good behavior is indisputable.

MR. John H. Studley, superintendent of the Middlesex Horse Railroad Company, might have celebrated a fortieth anniversary on the 17th ult., for on June 17, 1843, he began taking fares on his father's line of coaches, then running from Charlestown Neck to Brattle street, Boston. The fare was twelve and a half cents.—*Courier.*

THE Lamson Cash Railway Company, of Lowell, Mass., has declared a quarterly dividend of 1¾ per cent. on the increased capital, $1,000,000, payable July 1. The company also declares an extra dividend of $11.56 per share to stockholders of record Feb. 28.

CHICAGO has twenty miles of cable railroad, with 174 cars, and the steam engines do the work of 1,970 horses. The running time between the court house and city limits, a distance of four miles, is twenty-five minutes less than when horses were used.

THE People's Passenger Railroad, Baltimore, with about five miles of track, extending from Fort McHenry to Druid Hill Park, fifty horses and thirteen cars, has been sold at auction. It was purchased by the bondholders for $83,000.

BRADFORD, PENN., was a petty country village in 1875, when oil was struck near by; now it rivals Oil City in population (about ten thousand), and has a handsome exchange, an opera house, a street railroad, and two daily newspapers.

THE Rio Grande Bridge and Tramway Company, of Laredo, Texas, has filed a charter. Capital stock, $500,000.

List of Recent Patents for Inventions Relating to Tramways.

BEARING DATE JUNE 5, 1883.

278,709. Horse-Bell: Aaron D. Jacobus, Newark, N. J. Filed Sept. 22, 1882.
278,754. Fare-Register: Louis A. Touchet, Cambridge, Mass. Filed Dec. 15, 1882.

BEARING DATE JUNE 12, 1883.

279,123. Harness-Saddle: Henry J. Bickle and John E. Bridges, Dungannon, Ontario, Canada. Filed Dec. 26, 1882.
279,139. Horse-Canopy: Frank H. Dibble, Ansonia, Conn. Filed Mar. 31, 1883.
279,149. Crown-Terret for Harness: Henry C. Gill, Madison, Ohio. Filed March 26, 1883.
279,166. Veterinary Medicine: William Huffman, Salt City, Kans. Filed Feb. 27, 1883.
279,171. Bridle-Bit: Leonard S. Longcor, Belvidere, Ill. Filed July 1, 1882.
279,177. Horse-Collar Fastening: Owen H. Morris, New Haven, Conn. Filed March 6, 1883.
279,223. Horseshoe: Oren M. Chase, Detroit, Mich. Filed Jan. 15, 1883.
279,237. Buckle: George N. Freer, Blue Earth City, Minn. Filed April 12, 1883.
279,325. Street-Car Propulsion: Richard F. Bridewell, San Francisco, Cal. Filed Jan. 20, 1882.

BEARING DATE JUNE 19, 1883.

279,758. Adjustable Horseshoe: Peter Hicks, Napa, Cal. Filed Nov. 4, 1882.
279,784. Draft Attachment for Street-Cars: John P. Messer, Cedar Rapids, Iowa. Filed April 2, 1883.

BEARING DATE JUNE 26, 1883.

280,071. Adjustable Calk for Horseshoes: George W. Nickerson, Yarmouth, Mass. Filed Jan. 15, 1883.
280,107. Boot for Soaking Horses' Feet: William G. Wild, Bangor, Me. Filed May 11, 1883.
280,237. Halter: Robert Porter, Ottumwa, Iowa. Filed March 7, 1883.
280,300. Street-Car-Switching System: Thomas B. Estep, Cincinnati, Ohio, assignor of one-half to Hiram M. Stephenson, of Covington, Ky. Filed Sept. 22, 1882.
280,319. Buckle: Riley McCloskey and Daniel J. Coleman, Walla Walla, Wash.; said McCloskey assignor to said Coleman. Filed Dec. 9, 1882.

A Novel Fare-Register.

LOUIS A. TOUCHET, OF CAMBRIDGE, MASS., INVENTOR.

THIS fare-registering device is intended to be a source of revenue to all tramways using steam, as well as a perfect safeguard against dishonest conductors.

In the accompanying cuts, Fig. 1 is a perspective view, with the top removed to show the working mechanism, and mode of carrying by the conductor. Fig. 2 shows the middle compartment of Fig. 1, where the tickets are to be inserted by the conductor or passengers. Fig. 3, the receipt checks for cash fares and ticket fares.

In the use of this fare-register when a cash fare is taken from a passenger by the conductor, the cash strip J corresponding therewith is pulled upwards between its rollers and one of the receipt checks Q detached and given to the passenger, the coupon S, of the check being inserted in the middle compartment, and forced downward by the mechanism operated by the conductor.

When a ticket is taken in payment for fare, the ticket itself is inserted in the middle compartment, as above described for coupon S, and a receipt check is then detached from the corresponding strip J or ticket-strip, and given to the passenger. Checks on the strip for ticket fares are not provided with coupons, this not being necessary, as the ticket itself takes the place of the coupon S, used in collecting a cash fare.

The ticket receipt checks and the cash receipt checks are both of different colors, one being white and the other red or blue, as the fancy of the tramway companies may desire.

Each check that is pulled from the register is properly dated A. M. or P. M. as the case may be. The front of the register is entirely of glass in order that the tickets may be readily seen as they drop to the bottom of the case, and while the entire mechanism within the register can be seen in operation, there is no means by which to ascertain the amount of fare that has been registered, only when opened at the tramway company's offices.

The tramway companies provide the registers with strips and so arrange them as to be inaccessible, except for the purpose of removing the receipt checks as described.

From the foregoing it will be obvious that the strip J, prevents the conductor from defrauding the companies, as the number of checks detached from the strips indicates the number of fares taken, whether the same are in tickets or cash.

The alarm mechanism contained in the register now in course of construction, and for which steps have been taken by the inventor to fully secure all rights by additional letters patent, is a combination which cannot be easily imitated and concealed about the conductor's clothing, for the purpose of deceiving passengers in order not to register the fare; and even should such a thing be attempted on the part of the conductor, the mechanism in the register would fail to work and immediate detection would follow.

These fare-registers are of three different sizes, and have the capacity of registering from five hundred to fifteen hundred, either all cash or all tickets.

The actual experience of a conductor is, without doubt, the best possible means from which a fare-register can be constructed. Not the means to detect, but the means employed to defraud the companies, is what one must possess, in order to accomplish the object in view, when it is considered that the most improved locks can be opened and returned precisely as before opened within five minutes. It is certainly the safer way for the conductor to register every fare as he goes along, and the knocking down seven times out of ten is done by those who are least suspected. However, it is not fair here to give away the poor conductor and his many ways of knocking down; suffice it to say that the inventor claims that with all this knowledge in his possession, he believes that he has overcome, in this fare-register, all the means to defraud the tramway companies to a further extent than any other; and as much as is possible in a fare-register, where the honesty of the conductor is required to operate the same. Even then should the register be opened, which is too often the case, it would avail him naught, as everything within has been canceled and rendered unsaleable.

As these receipt checks are intended and designed to be printed on both sides with advertising cards, it will be obvious that

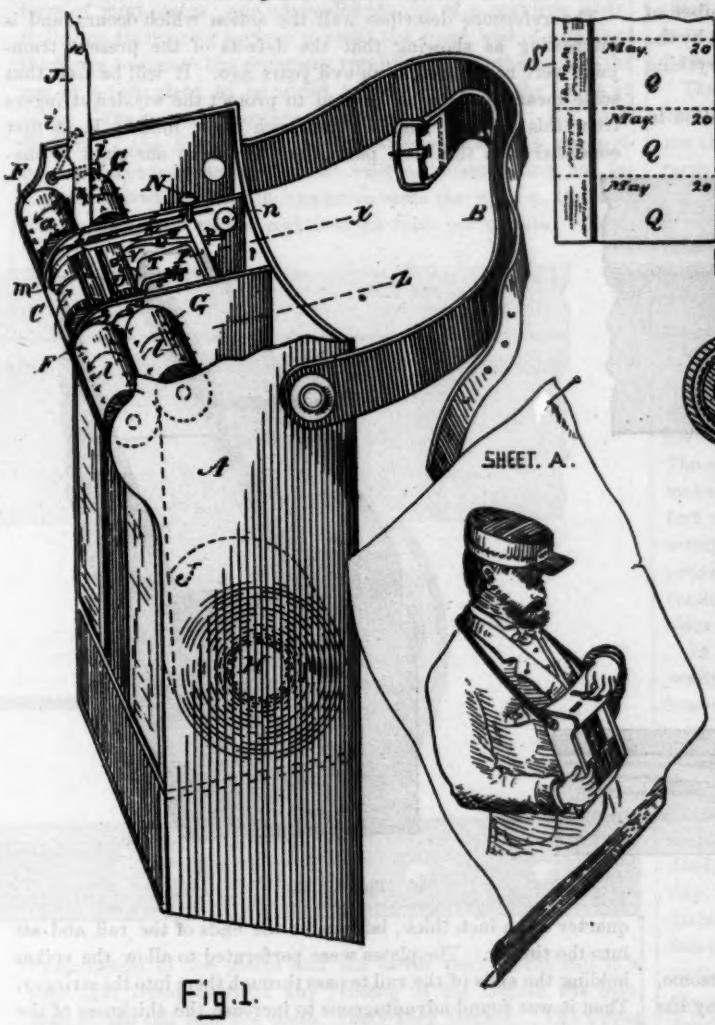


Fig. 1.

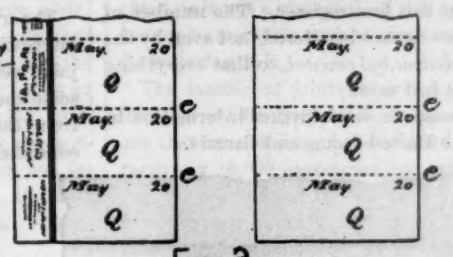


Fig. 3.

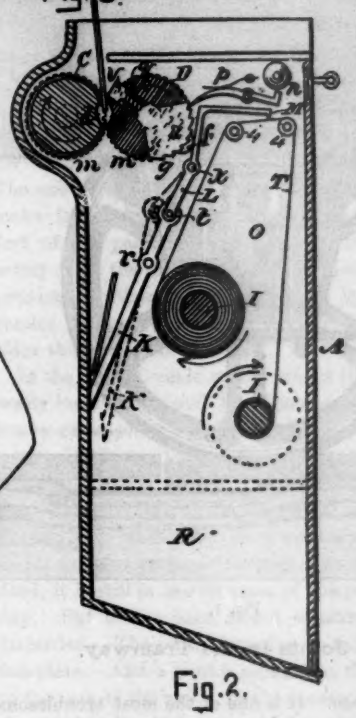


Fig. 2.

by judicious management, and by employing solicitors and advertising agencies, a large income can be secured with which to pay the royalty for the use of the register, and as some claim the salary of the conductor, if not more.

Another grand advantage gained by this advertising card on the receipt check, is that local advertisers will take an interest in this device, and watch the conductors to see that their advertisements are paid out, thereby bringing about a result very favorable to the tramway companies.

The trip papers, by which the number of passengers registered is indicated by the number of perforations thereon, the trip slip and dials, and all such devices which can be turned back to any desired point in a moment, by any one who can open the register, have all been avoided in this fare-register. The number of fares registered by this device cannot be altered, not even by the company. *Done never to be undone, but renewed*, so that everything must invariably stand for its full value.

The inventor will be pleased to send further information to any tramway company in the United States and Canada.

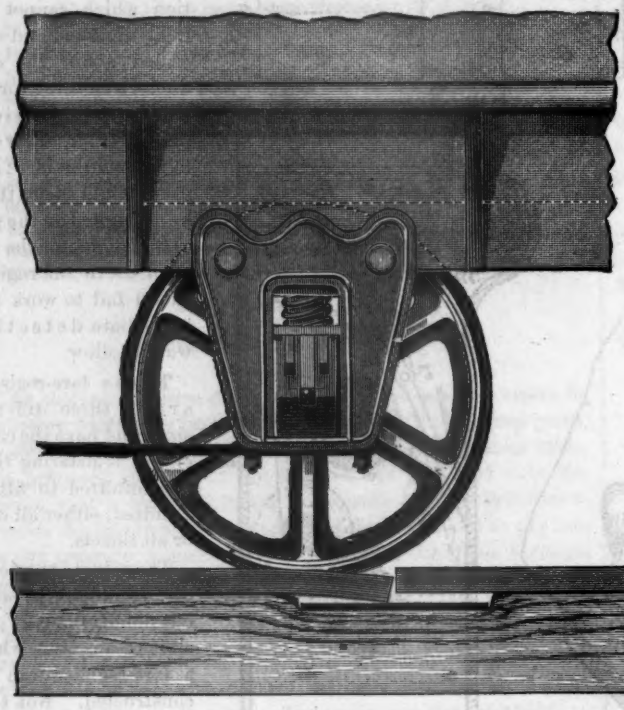


Fig. 1.

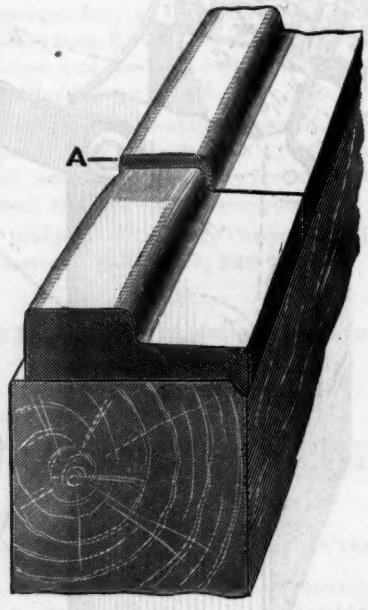


Fig. 2.

On Defective Joints in the Tramway.

The subject is a large one. It is one of the most troublesome, and in a small way, most costly problems that the tramway has to contend with. Because "there is so much of it." In every mile of single track there are 352 joints. The average mileage per tramway in the United States, is from recent statistics, a little over seven miles of single track. Treating the matter therefore in a general way, each tramway company has to maintain 2462 joints. The defect in a single joint may be a slight one, but a small evil multiplied twenty four hundred and sixty two times becomes worthy of consideration.

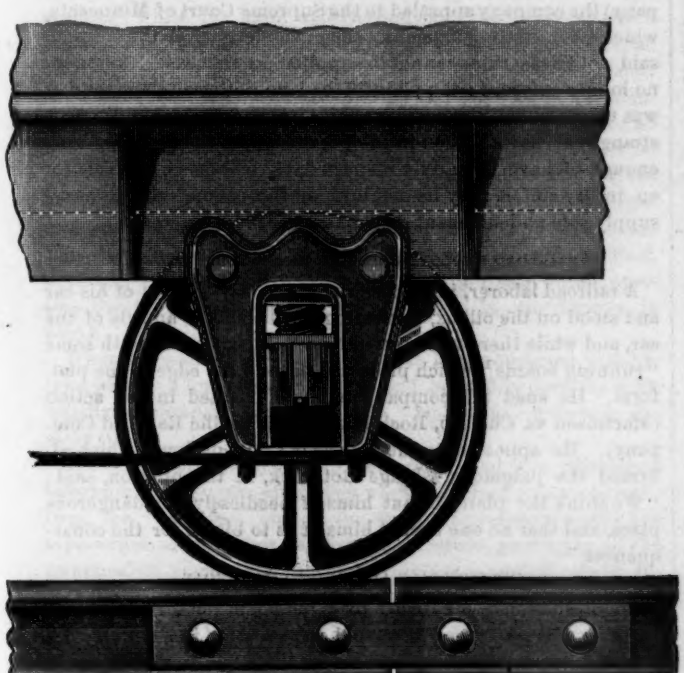
Originally the tram rail was spiked directly to the stringer, and no special provision made for the joint. The latter did not last long. The effect peculiar to the flexible ribbon-like rail of present practice is worth noting. Among some notes culled at random by the writer, is one taken some years ago (1875) from one of Van Nostrand's Magazines. It says: "It is a curious fact that by the most casual glance at a street railway track one who has noted the manner of its wear can tell from that alone the direction in which the cars run thereon, whether 'up' or 'down,' or both. On the north end of the track, the south end of the rail is most worn and vice-versa. The reason for this is that with the imperfect fish joint used (the term employed is incorrect), where indeed any chair or stiffener is used, the weight of the car on the north-bound track depresses the north end of the rail and lifts the south end, partly drawing the spikes therein; and the wheels strike full and hard against the south end of the next rail (raised by the passage of the previous car), and tends to round the head and split the flange vertically, a result which is not long in showing itself. The middle spikes are hardly ever drawn at all; those in the ends are loose, and may be easily drawn, as one might expect from their being partly drawn and re-driven from twenty to sixty times an hour."

The reference describes well the action which occurs, and is interesting as showing that the defects of the present tram-joint were recognized as an evil years ago. It will be seen that some means had to be devised to protect the wooden stringers from this action. And we find such effort made. It at first consisted of a thin iron plate, generally from one-eight to one-quarter of an inch thick, laid under the ends of the rail and set into the timber. The plates were perforated to allow the spikes holding the ends of the rail to pass through them into the stringer. Then it was found advantageous to increase the thickness of the plates, and they were made from three-eights to seven-sixteenths of an inch thick, and were lengthened; the increase in length being added to the end supporting the rail which sustained the greatest shock. A further improvement was effected by making the plates with a flange on either side which gripped the rails and held them from any lateral movement. Owing to the cost of preparing such plates of wrought-iron, cast-iron was resorted to. With the introduction of cast-iron and therefore the comparative economy of making any shape desired, we find the efforts to secure a perfect chair multiplied, many different shapes introduced, and much ingenuity exercised in the effort. Also with the introduction of cast-iron came necessarily a greater thickness of plate and consequently greater cutting away of the stringer. The pocket thus formed became an evil. It held the moisture, rotted the timber, and let down the joints. When this latter tendency is added to the effect above described, we reach the "typical bud-joint," and we have secured it most thoroughly.

The illustrations given, Figs. 1 and 2, do not exaggerate the nature of the joints in many a tramway of to-day. There are some companies who compete most bravely with their joints, and who in spite of the persistency and determination of the joint to be bad do succeed in maintaining a smooth track, but they do it at the cost of infinite patience and great expense.

The usual method is to place a thin liner under the joints as the rail goes down. This is done by drawing the spikes, lifting the ends of the rail, and slipping a thin sheet iron liner from one-sixteenth to one-eight of an inch in thickness under the same, and thus keeping same level.

There are, to-day, two distinct views entertained as to the best form of joint plates; one advocates the use of a cast-iron plate, chilled on its bearing surface to resist the wear, and of sufficient thickness to secure the necessary rigidity. The other urges the use of a thin plate, to be added to continually as the joints go down. There are arguments in favor of both sides. Mr. Aug. Wright, of the North Chicago City Railway company, an engineer of large experience in street railroad construction, has informed the writer that in excessive cases the wear at the joint has been as much as one-eighth of an inch per annum. On an



examination of the plates and the lower part of the rail it is seen that, irrespective of any yielding of the timber, the iron, both of the rail and the plate, wears very quickly. The writer has in his possession a cast iron joint plate in which the difference of wear of the part supporting the end of one rail as compared with the part supporting the end of the other rail is fully five-sixteenths of an inch. In this case the surface was not chilled. From this it would appear that lining up becomes necessary even with the solid cast-iron joint: and it might be urged that if the wear is so great with iron against iron, and so uneven on one part of the joint as compared with the other part thereof, is it not better to save the cost of a thickness, only part of which is utilized. So far, those who advocate the thin liners, appear to have the best of the argument.

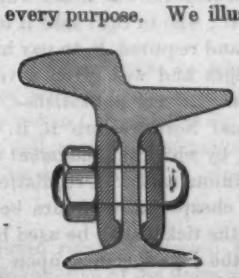
On the other hand, this rapid wear of the joint can be reduced by chilling the bearing or upper surface of the joint plate, while the wear of the rail can be reduced by making same of steel instead of iron. It might be also mentioned in this connection, that the effect of cold sawing a steel rail is to harden the two ends so sawed. It would perhaps be interesting to ascertain how far the hardening effect extended from either end. If found to extend sufficiently far, it might be made further available as a means of reducing the wear at this point. There is again another consideration. In relying upon the use of liners to the extent advocated by those who uphold this policy, we must consider, as a factor in the case, the natural tendency of human nature to defer a needed improvement, particularly when such procrastination carries a delusive economy upon its face. If judged by the latter consideration, and perhaps it is the most potent of all, it would appear to be better to secure a more durable, if more costly joint in the first place.

After all the question arises, if the wear of iron on iron is so great, is it not a wasteful, if not an almost hopeless task to endeavor to maintain such a joint level. There are strong grounds for believing it is.

The matter of joints is not one of cost alone. It is the one item *par excellence* that affects the comfort of the passenger, and one that cannot long be disregarded. A paying tramway will carry say 10,000 passengers per car per year. Suppose a car to run 300 days out of the 365 days in the year, making an average of seventeen hours a day, at an average speed of five miles an hour. This would give us 70,000 passengers carried for 25,500 miles run by the car. Supposing further, that with this traffic, a car averages eight persons continually in the car. In 25,500 miles we have 8,976,000 joints; on the above basis this gives us 1,025 joints as the distribution for each passenger. Two wheels run over every joint, and we therefore have the discomfort of what is equivalent to 2,050 bad joints sustained by each passenger. This is the problem of the future for the tramway system. The one great object to be carried out in making a line pay, is to make it popular. This can only be done by studying the comfort of the passengers. There are few who have not suffered sorely from the discomforts of bad joints. The increasing competition of other means of transit is beyond question going to render it imperative upon street railroad men to carefully consider this problem.

In the case of cable roads, where the passenger traffic is generally heavy, this evil has become one of great moment and of heavy expense.

An article on tramways in a recent issue of this journal, appealed to steam railroad practice as offering a field for copy in many things. We will again secure an example from this field. Formerly the railroad system used a chair or joint plate, similar in its general purpose to that now used by the tramway. Indeed, it is still in use on some of the poorly equipped roads of to-day. But it has been found wanting, and has been virtually discarded. The joint of to-day in railroad practice is the angle fish-plate. And a joint is secured by this means, equal in strength to the rest of the rail. In the tramway, owing to the support of the road-bed, which is wanting in the railroad, a plain splice or fish-joint answers every purpose. We illustrate below such a



joint. It has been found very effective in practice. So smooth is the travel of the car, that experts are unable to detect its joints. As the fit is iron to iron, and of unyielding rigidity, the wear of the rail is no greater at this point than in the rest of the rail, and moreover, once imbedded in the road-bed it is virtually imperishable. There are two points wherein such a joint must be productive of great economy, viz: in repairs to cars, owing to

the smoother track, and in the maintenance of way, owing to the fact that it becomes unnecessary to tamper with the rail. The saving cannot well be less than one-half in these items. By some who have used the joint, it is considered greater.

The following figures are instructive. They are the actual figures of the proportion that the cost of repairs to cars, and to the way, bear to the whole working expenditures on some English street railways. The practice not being to distribute expenses in this country, in this way, we are unable to give data for American practice. Nevertheless, as they are given in percentages, while the amount *per se* may vary, the proportion borne by that amount to the whole cannot be greatly out.

Owing to the perfect track system in vogue in England, the difference, if any, would be towards an increase of the given percentages for this country.

NAME OF LINE.	Repairs of cars. per cent.	Maintenance of way. per cent.
North Metropolitan Railway.	.4.39	3.07
London Tramways.	.4.77	3.12
London Street Tramways.	.4.20	3.27
Dublin Tramways.	.6.22	6.62
Glasgow Corporation Tramway.	.5.26	3.10
Edinburgh Street Tramway.	.4.83	6.01
Leeds Tramways.	.7.38	3.21
Provincial Tramways.	.8.62	3.38
General Average.	.5.71	3.97

We will reduce this item to dollars and cents. In English practice, the two items amount to 9.68 per cent. of the operating expenses. For the purposes of calculation, we will take a tramway three and one-half miles in length, capitalized at $56,000, in which the gross receipts are forty-three per cent. of the capital, the operating expenses thirty-two per cent. of the capital, and therefore the net receipts or dividends eleven per cent. We have then gross receipts, $24,080.00, operating expenses, $17,920.00, and net receipts, $6.60. The English average of the two items under discussion, is 9.68 per cent. of $17,920.00, or $1,734.65. It would be within the mark if we add to this one-fourth to allow for the far more perfect track system in use in England, and consequently lower percentage of repairs there as compared with American practice. This would give $2,168.31 as cost of maintenance of way, and repair of cars, for three and one-half miles of road, or equal to $619.52 per mile, per annum. If the joint in question would save one-half of this, or $309.76 per mile, it would at the rate of seven per cent. interest, pay for the investment of $44,251.12 per mile to effect the purpose. Surely the matter is worthy of consideration from every point.

Recent Legal Decisions.

SOME POINTS IN RAILROAD LAW—NON-TRANSFERABLE TICKETS NOT TO BE TAKEN UP—RISKS OF EMPLOYES.

T. BOUGHT a third-class railway ticket which was not transferable and sold it to H., who in turn sold it to P. The conductor took up the ticket and required P. to pay his fare. P. sued the company for damages and was given a verdict for $31.70, the value of the ticket. He was not satisfied, and carried the case (Post vs. Chicago and Northwestern R. R. Co.) to the Supreme Court of Nebraska, by which the judgment was affirmed. Judge Maxwell, in the opinion, said: "A regulation of a railroad company providing for cheaper rates of fare between certain points and requiring that the ticket shall be used by the person getting it only and within the days specified upon it is reasonable and proper, and it is of no validity in the hands of a third person. Such a ticket, however, cannot be taken by the conductor from the holder of it, for he is entitled to the possession of it to enable him to recover the amount he paid for it from his vendor."

RAILROAD EMPLOYE TAKING RISK.

A man whose direct duty was on the "bridge gang" of a railroad company was ordered with other men to repair a well which supplied water for the engines. This well was in a dangerous condition, and the workman was badly injured by the earth above falling on him. He sued and recovered damages from the company, which carried the case, in error (Galveston, H. and St. A. R. R. Co. vs. Lempe), to the Supreme Court of Texas, which reversed the judgment. The Chief Justice (Willie), in the opinion, said: "When a person enters the employment of another he assumes all the risks ordinarily incident to the business, and he is supposed to have contracted on these terms, and when he has equal knowledge with the master of the danger incident to the work he takes the risk upon himself if he goes upon it."

DEFECTIVE CARS AND INJURY OF EMPLOYE.

A brakeman was injured in coupling by hand one of the cars of his own road with a freight car of another road which had come into the service of his company, and sued his road for damages and recovered. It was shown that the strange car was defective and that the defects were discoverable on inspection, and the company offered to show by its rules that coupling by hand was prohibited, sticks being prescribed. But on the objection that these rules had fallen into disuse the offer was rejected. In this case (Fay vs. Minneapolis and St. Louis Railroad Company) the company appealed to the Supreme Court of Minnesota, which affirmed the judgment. Judge Vanderburg, in the opinion, said: "These rules cannot be applied in this case; they were no longer enforced; the plaintiff had no notice of them, and it was the accepted, the usual practice, to couple by hand. This strange car having been in the possession of the company long enough to have been duly inspected, the company is liable for an injury suffered by its employé, on the ground that it must supply safe and sufficient instrumentalities for its work."

RAILROAD EMPLOYE EXPOSING HIMSELF TO DANGER.

A railroad laborer, in performing some duty, got out of his car and stood on the oilbox, a covering for the end of an axle of the car, and while there was injured by coming in contact with some "running boards" which projected beyond the edge of the platform. He sued the company and was defeated in the action (Martinsen vs. Chicago, Rock Island and Pacific Railroad Company). He appealed to the Supreme Court of Iowa, which affirmed the judgment. Judge Rothrock, in the opinion, said: "We think the plaintiff put himself needlessly in a dangerous place, and that no one except himself is to blame for the consequences."

SHERIFF'S SALE ADVERTISED ON SUNDAY.

An injunction was refused to a judgment debtor whose real property was advertised to be sold on execution in a Sunday paper. He appealed the case (Shaw vs. Williams) to the Supreme Court of Indiana, which decided in his favor. Judge Elliott, in the opinion, said: "A sheriff can do no business on Sunday unless it is of an extraordinary character, and it cannot be said that the advertisement of an auction sale is anything more than a usual act on his part."

NUISANCE CREATED BY A RAILROAD COMPANY.

The engine house and repair shop of a railroad company were so conducted that the congregation of a church built and occupied before these buildings of the company were put up and used, were injured in their clothing and greatly discommoded in their worship. In a suit for damages a judgment of $4,500 was recovered, and the case, in error (Baltimore and Ohio Railroad Company vs. Fifth Baptist Church), was carried to the Supreme Court of the United States, which affirmed the judgment. Mr. Justice Field, in the opinion, said: "That is a nuisance which annoys and disturbs one in the possession of his property, rendering its ordinary use or occupation physically uncomfortable to him. For such annoyance and discomfort the courts of law will afford redress by giving damages against the wrong-doer, and when the cause of the annoyance and discomfort is continuous, courts of equity will interfere and restrain the nuisance."

The Type-Writer.

PROMINENT among a multitude of time and labor-saving machines found at the Chicago "National Exposition of Railway Appliances," was the Remington Standard Type-Writer, exhibited by Messrs. Wyckoff, Seamans & Benedict, 38 East Madison St., Chicago, Ill., and 281 & 283 Broadway, New York, sole agents.

Although railroad officers were at first slow in recognizing this instrument as an essential and necessary railroad appliance, and its introduction in such direction is of comparatively recent date, yet now very few railroad offices are run without the aid of these wonderful little machines. In fact, they have become indispensable in the facilitating of a necessarily large correspondence.

The Standard machine, as now manufactured by E. Remington & Sons, of Ilion, N. Y., has so nearly reached perfection that it is sent forth under an *absolute warranty*, and owners and operators agree in saying that they are seldom if ever called upon to make even the slightest outlay for repairs, during years of constant hard service. It is so simple in construction in all its details, and so easily manipulated, that any person of ordinary intellect can learn to use it in a very brief time; and can write at a speed much greater than that with the pen after a few days' practice; while the more experienced and expert operator will prepare most perfect copy, with capitals, small letters, figures, and punctuation, at the rate of from *sixty to ninety words per minute*, or at *three times* the speed attained by the most rapid penman. And this rate can be kept up hour after hour with little or no fatigue as compared to that of pen-writing. *Practice* only, is required to produce the most skillful and rapid operator. Even *the blind* soon learn to use it successfully. And for this unfortunate class of citizens we can scarcely imagine a greater boon. The case of Mrs. C. L. Crandall, the estimable wife of Prof. Crandall, of Cornell University, who though totally blind operates the type-writer rapidly and accurately, is one directly in point.

When an operator is so fortunate as to have combined with his type-writing a knowledge of short-hand, he readily does the work usually accomplished by *six or eight* "long-hand" writers in the same time.

Recent experiments have demonstrated that any intelligent telegraph operator can, after a few weeks' practice, receive directly from the "sounder" and at the same time transcribe with the type-writer, using upper and lower-case letters, putting in all the punctuation marks, etc.; in short, *making a perfect copy as the matter comes from the wires*, more rapidly and easily than is possible with pen or pencil. In fact, *several copies* can be taken at the same time in the same way—by using sheets of paper interlaid with carbon—all as legible as print. If managers of telegraph offices would insist upon having their operators use these machines, a large amount of time and trouble would be saved to the Press and others, who are compelled to decipher the hurried pen-work of receivers of Press dispatches. A notable example of what may be accomplished in this direction is to be found in the experience of Mr. Charles F. Lantry, telegraph operator at Elmira, N. Y., who says in a letter referring to his method of receiving Press dispatches, that although he has but just begun to use the type-writer for taking "Press" matter, he is able to receive from the wires by the hour without breaking, and with far less fatigue than when using the pen.

The demand for this machine has increased from sixty to one hundred per week, within the last year, and is still increasing so rapidly that the facilities of the manufacturers are taxed to their utmost to meet it.

The writing machine should be, and soon will be adopted, not only by railroad companies, but by all persons having writing to do, without regard to position, business, or profession.

[The foregoing article was handed us by our representative at the "Exposition" at Chicago. It may be added that the type-writer is in use in the offices of the JOURNAL, giving satisfaction; and it is believed by the management that the new and important departure in conjunction with the telegraph, to which reference is so opportunely made, is yet to be utilized in almost unlimited degree. The statement as to uses of the type-writer by the blind, are also worthy of consideration.—AMERICAN RAILROAD JOURNAL].

Railroad Construction in the Northwest.

THE Marquette and Mackinaw Railroad is to be extended from Marquette to the iron mines, and a branch line is to be built from the main line to Sault Ste. Marie.

Messrs. Newberry & McMillan and Francis Palms, of Detroit, in order to secure better terms and accommodations in handling their iron ores, will build and own a road for themselves. The Marquette, Houghton and Ontonagon Railroad, now and for a long time has done the whole of the freight business between Marquette and the mines. Newberry & McMillan, Francis Palms and the group of capitalists known as the George I. Seney Syndicate (who built the Nickel Plate Railroad), have raised a fund of $2,000,000 for the improvements contemplated, and General Manager McCool, of the Marquette and Mackinaw Railroad, is now at work superintending the location of the extension from Marquette to Negamee and Ishpeming, upon which the work of grading and construction will begin in a very short time. The length of the road to be built from Marquette to the mines, is fourteen miles, which with various little spurs of line to the several mines makes a total of seventeen miles. The country through which it is to be built is very uneven and rocky, and the cost of the work will be upwards of $40,000 per mile. The length of the branch road from the main line to Sault Ste. Marie is forty-eight miles (three surveys preliminary have already been made, but the located line is not yet known) through a heavily timbered country. In connection with the branch road its builders will construct a bridge across the ship canal and St. Mary's River, and by the terms of the charter (provided by an act passed by the Dominion Parliament, and by a bill passed by the Congress of the United States), the bridge must be completed before 1886. Newberry & McMillan have two iron furnaces on the Marquette and Mackinaw road, and the extensive ore wharfs at St. Ignace, besides two or three furnaces on the Grand Rapids and Indiana Railroad. They will also construct extensive ore wharfs at Marquette. It is in the handling of ore for these places and for shipment down the lakes that the immediate benefits of the extension to the mines will result. The Canadian Pacific Railroad and the Grand Trunk Railroad have built their roads to within sixty miles of St. Mary's River, and, when completed to that point, the bridge across the river and the extension must bring large patronage from both Southeast and East and West and Northwest. In addition there are the lumber and grain interests of Chippewa County, which will provide liberal local traffic.

GEORGE H. CORLISS, at whose works in Rhode Island the big Centennial engine was built, is building the engine for the first cotton mills to be erected in China. The Chinese are becoming so civilized that they will soon be able to compete with the rest of the world in making silks and satins, nine-tenths cotton and one-tenth shine.

A RAILROAD was opened recently between Tiflis, the capital of Transcaucasia, and Bakou, one of the ports on the Caspian Sea. It is intended to connect this last with the Black Sea. This road reduces communication from five days to fifteen hours between Tiflis and Bakou. It is the greatest commercial achievement yet of Alexander III's reign. The line traverses a region reputed to be enormously rich in petroleum. The petroleum business was at its outset almost entirely in the hands of Armenians, but it is now shared by persons of divers nationalities.

A Club for Strangers.

Success of the Junior Century.

Methods and aims of a peculiar social organization.

The Junior Century is the title of an association connected with Grace Church parish, and sustained by the thoughtful munificence of the parishioners. Yet it is not a parish society, nor a church society. It is not a diluted form, even, of a Christian association; nor is it an evangelical mission under a thin disguise of bookish philanthropy. Nor is it a snug harbor or rallying ground for idle "cranks" or tramps; nor a Holly Tree Inn, with its pious dole of tracts and coffee. It is approached through a fascinating bit of city gardening. It nestles in a group of commanding Gothic architecture in white marble. One must pass under the shadow of a church and by the door of a rectory to enter it, but there is nothing intrusive in either. Indeed, it is unlike any other club. No trade or profession or creed or sex monopolizes it. No golden key or heavy bank account will open its doors, and no burdensome dues or fees or assessments break in upon the repose of its membership.

To be sure, one misses the fumes of a busy kitchen. There is a want of wine cellars and the festive atmosphere of the bar-room and restaurant. One misses the flashy slang, the ill-flavored stories, the shuffling cards with well-spiced "points," and the everlasting patter of "sports" and stock operators. A clean bill of honesty and morality alone will open the doors of the Junior Century, and one must be a dweller in lodgings, lonely or a stranger, and busied in some respectable calling. In short, the Rector of Grace Church in this organization had in mind that large class of striving, deserving, unfriended, yet intelligent men and women, to whom the enforced solitude and isolation of a great city come with keenest privations of fellowship, home and its community of thought and feeling.

The surest welcome to the hospitality of the Junior Club is to experience the sorest need of it. Opening with some fifty members, it has strained its limits to its legitimate "hundred," with fifty-five more. There is positively no religious test or consideration recognized. A clergyman is usually in attendance during the day, but in the club-room he is the gentleman and not the ecclesiastic. The first floor is a bright, prettily furnished apartment, with a well-appointed table for reading and writing, comfortable chairs, files of papers, the current magazines, and all the appliances of a well-ordered reading-room. A carefully selected library occupies shelves on one side of the apartment, books meant for instruction as well as for recreation. Each member serves as his own librarian, leaving his card of membership in a place opposite his name when a book is drawn. There are more than 1,000 volumes, and additions are continually made as special wants are developed. A short time ago the members were invited to send in lists of such works as they consider especially desirable or valuable. More than 500 titles were recorded, covering an admirable range of literature, and every volume, with a few exceptions of very costly publications, was at once purchased. Indeed, the membership in this and in many practical details of club activities, exercise a personal influence on committees and in offices of trust. Adjacent to the reading-room is a snug little room devoted to chess and the more informal intercourse of the men, where tobacco is not excluded. The rooms are open afternoons and evenings.

On the floor above is a more spacious suite of rooms, where a woman's bonnet finds a home. This is open during the whole day and evening, and a matron is in constant attendance, who answers the summons of the bell. These rooms are furnished rather more attractively than those down stairs, and are supplemented with spacious and admirably appointed retiring rooms, where baths may be ordered at the convenience of the women. Half of the library is kept up-stairs, half below; a complete catalogue, however, in both rooms, and a desired volume may be sent for at any moment by summoning the janitor or matron.

It is clearly felt by all interested that no obligations are incurred and no charities extended. The relation nowhere touches or challenges the self-respect of the members. It is their home, under the regulations of the club, without let or hindrance or reservation so long as membership is kept up. On the first Monday of each month both branches meet in the women's club rooms, with certain invited guests. Conversations, discussions, criticism of new books or striking magazine articles fill the time. Introductions are made, acquaintances formed, and a strong and restful social element enters into the evening. It concludes with light, wholesome refreshments, and proves an occasion of most welcome recreation. On the third Monday evening of each month both branches of the club again meet, and a pre-arranged entertainment, musical, literary, or miscellaneous, is provided by the club committee, acting in concert with the parish board, and always reinforced by the ready and sagacious help of the clergy; some of the best professional talent of the city has assisted on these evenings. Sometimes the celebrated choir of the church lend their services, and sometimes brilliant amateurs belonging to the congregation contribute to the pleasures of the evenings, But the entertainment is invariably attractive. These two monthly reunions involve no expense whatever for the membership, but are provided by the parishioners, who, however, keep steadily in the background. The clergy appear on these occasions in a companionable, social way, giving introductions to the readers, lecturers or artists, and bringing people together who are strangers. Here are two agreeable, wholesome evenings provided for each month; surely something accomplished is breaking in upon a strange, lonely life in the city.

The club-rooms are generously supplied with gratuitous stationery, and may be used for correspondence, interviews with friends, and especially by women in lodgings for the calls which they may receive. The women's rooms, however, are never accessible to men save on the two monthly evenings already mentioned and no one is then received without the club introduction, which is made a sufficient guarantee of respectability.

It is naturally inquired at what charges the Junior Century is available to its membership. The charges are merely nominal, and so fixed that while the absolute independence of the membership is secured, the member may yet do something regularly for the fund. All contribute twenty-five cents monthly, or two dollars and a half each year; and there are no contingent charges or assessments. It is difficult to estimate the steady measure or practical benefit flowing from this unique organization. Women come to New York for special studies in music and art at the Cooper Union and elsewhere, or to prepare for teachers' work, or to take classes in schools, or to pursue some other honorable industry. A proper letter of introduction is recognized gladly by the parish committee, and the stranger finds herself at once relieved from the loneliness and wretchedness of lodging or boarding house life, introduced among intelligent and congenial people, and the best substitute for home safeguards and privileges placed within her reach. Young men—students, clerks, those entering mercantile or professional life, without domestic or social relations—here meet on common grounds of intelligent and well-ordered intercourse. Already incidents are recorded which illustrate abundantly the far-reaching helpfulness of the Junior Century, and it is only necessary to meet any of its membership to learn how well it does its work. The opportunity is by no means exhausted; there is room for many more Junior Centuries in New York; and large cities elsewhere may profitably follow the example of Grace Church in her care for the stranger and friendless.

The cheap production of steel rails was invented by Bessemer in 1856, less than thirty years ago, and with consequences of incalculable importance to the railroad industry.

New Inventions.

TO INVENTORS AND PATENTEES.

This department is devoted to the notice, consideration and description of new and valuable inventions applicable to Railroads, Steam Navigation, Machinery, Manufactures, Mining and Tramways. New patents of this description appearing in the weekly Official Gazette of the Patent Office are duly noticed in our columns, and full descriptions of those most useful and important are published *free of charge*.

☞ Inventors, Patentees, and the holders of Patents are requested to forward us their claims and specifications, with description of their inventions for our examination with a view to their publication in this department. Descriptive cuts, diagrams, and illustrations of the same are also desired.

☞ In selecting inventions for full description in this department, the editor will be guided solely by their importance and value, and their interest to the readers of the AMERICAN RAILROAD JOURNAL.

List of Patents for Inventions Relating to Railways, Machinery, Etc.

BEARING DATE JUNE 5, 1883.

278,678. Track-Bolt Lock: D. Franklin Blighton, Buffalo, N. Y. Filed April 20, 1883.

278,693. Car-Coupling: Wm. Emmett, Logansport, Ind. Filed Oct. 11, 1882.

278,698. Car-Axle Box: James Garland and James Kenyon, Lynchburg, Va. Filed Jan. 22, 1883.

278,726. Car-Wheel: Jno. R. Morgan, Alliance, Ohio. Filed Feb. 23, 1883.

278,728. Car-Coupling: Walter B. Nichols, Danville, Ky. Filed March 29, 1883.

278,757. Shelf for Refrigerator-Cars: Robert H. Waters, Malden, Mass., assignor to the Post Refrigerator Car Compay, Portland, Me. Filed Oct. 27, 1882.

278,764. Car-Coupling: James S. Bayley, York, Pa. Filed Feb. 13, 1883.

278,770. Railway Running-Gear: Chas. Brown, Winterthur, Switzerland. Filed April 25, 1883. Patented in France Oct. 14, 1882, No. 151,570.

278,789. Car-Coupling: Walter F. Freeman, Mineola, Tex., assignor, by direct and mesne assignments, of three-fourths to Robertson F. Shrewder, George A. Cage, and Benjamin F. Read, all of same place. Filed Oct. 28, 1882.

278,813. Draft-Regulator for Locomotive and other Furnaces: Horace W. Norwood, Philadelphia, Pa., assignor to the Norwood Spark Preventive and Smoke Consuming Company, Camden, N. J. Filed Dec. 15, 1882.

278,814. Draft-Regulator: Horace W. Norwood, Philadelphia, Pa., assignor to the Norwood Spark Preventive and Smoke Consuming Company, Camden, N. J. Filed Nov. 9, 1882.

278,831. Car-Signal: Salmon Thompson and William E. Farrell, Masonville, Iowa. Filed July 27, 1882.

278,833. Car-Brake: Wm. B. Turner, New York, N. Y., assignor of one-half to Cornelius Beard, same place. Filed Nov. 15, 1882.

278,838. Car-Coupling: Cary Van Deusen, Hudson, N. Y. Filed April 12, 1883.

278,843. Car-Wheel: Henry G. Yates, San Francisco, Cal., assignor, by direct and mesne assignments, to the Planetary Wheel Manufacturing Company, of California. Filed Oct. 2, 1882.

278,880. Car-Coupling: A. Wells Case, South Manchester, Conn. Filed Mar. 7, 1883.

278,895. Door and Door Attachment for Grain-Cars: Charles C. Duffy, Newport News, Va. Filed Oct. 2, 1882.

278,940. Electric Railway-Signal: William Hadden, Brooklyn, assignor to the American Railway Signal Company, New York, N. Y. Filed Aug. 26, 1882.

278,964. Railway-Car-Axle Lubricator: Chas. P. Holmes, Gouverneur, N. Y. Filed Feb. 27, 1883.

278,978. Manufacture of Railroad-Ties from the Refuse of Sugar-Cane: Edward C. Le Bourgeois, Springfield, Mass. Filed Oct. 28, 1882.

279,008. Electric Motor: Charles C. Peck and William H. Chapman, Middlebury, Vt. Filed Jan. 15, 1883.

279,018. Car-Brake: Geo. F. Renouf, Battle Creek, Mich. Filed Mar. 16, 1883.

279,049. Car-Starter: Emil Utz, Halstead, Kans. Filed March 26, 1883.

279,059. Car-Coupling: Charles Weik, Jr., Bristol, Pa. Filed Dec. 21, 1882.

279,062. Refrigerator: James H. Wickes, East Rochester, N. Y. Filed April 7, 1883.

279,072. Signal Head-Light: William Armstrong, Martinsburg, W. Va., assignor of one-half to David M. Newbold, Baltimore, Md. Filed Nov. 7, 1882.

279,084. Railway Time-Signal: Henry H. Eatherton, Monticello, Ill., assignor of one-half to A. C. Thompson, same place. Filed March 22, 1883.

279,088. Spring-Washer for Locking Nuts: Thomas M. Erwin, Verona, assignor of one-fourth to Edward Fried, Allegheny City, Pa. Filed May 4, 1883.

279,092. Track-Laying Device: Jno. M. Goodwin, Sharpsville, Pa. Filed June 5, 1882.

279,102. Locomotive: Daniel R. Murphy, Newark, assignor of one-half to Gurdon B. Johnson, Granville, Ohio. Filed Jan. 2, 1883.

BEARING DATE JUNE 12, 1883.

279,121. Car-Coupling: Jacob N. Best, Denver, Colo., assignor to the Best Car Coupler Company, same place. Filed March 12, 1883.

279,136. Automatic Car-Brake: Jacob David, Brooklyn, N. Y., assignor of one-half to Edward A. Deveau, same place. Filed Oct. 24, 1882.

279,137. Sleeping-Car Berth: Adolphus Davis, Montreal, Quebec, Canada. Filed Nov. 1, 1882.

279,162. Stock-Car: Henry C. Hicks, Minneapolis, Minn. Filed Oct. 7, 1882.

279,163. Refrigerating-Car: Frederick C. Hills, Newton, Mass. Filed Jan. 2, 1883.

279,185. Car-Truck: Patrick Reilly, Mattoon, Ill. Filed March 16, 1883.

279,201. Car-Coupling: Isaac L. Stover, Centralia, Ill. Filed April 9, 1883.

279,217. Car-Coupling: Levi I. Bodenhamer, Kernersville, N. C. Filed Aug. 21, 1882.

279,225. Automatic Railway-Alarm: Frank Clifford, Carson City, Nev. Filed June 3 1882.

279,229. Car-Coupling: John H. Depew, Peekskill, N. Y., assignor to himself, James Depew. and James C. Acker, same place. Filed Nov. 29, 1882.

279,255. Grain-Car Door: Frederick L. Kirkbride, Wyandotte, Kans., assignor of two-thirds to Robert H. Drennon and William C. Duvall, both of Kansas City, Mo. Filed March 27, 1883.

279,267. Coupling for Bell-Cords, etc.: George W. Nock, Philadelphia, Pa. Filed Feb. 24, 1883.

279,280. Permanent Way for Railways: Fridolf Schauman, Landskrona, Sweden. Filed Sept. 22, 1882.

279,281. Car-Coupling: Samuel H. Scott and George J. Talmage, Chanute, Kans. Filed March 19, 1883.

279,292. Apparatus for Recording Speed of Trains on Railway-Bridges: Jan H. M. Waldorp, Nymwegen, Holland. Filed April 10, 1882. Patented in France Feb. 23, 1882, No. 147,522; in Belgium Feb. 24, 1882, No. 57,154; in England March 1, 1882, No. 990, and in Germany March 10, 1882, No. 20,401.

279,299. Nut-Lock: James Wilkes, Winnipeg, Manitoba, Canada. Filed Mar. 9, 1883.

279,303. Car-Coupling: John Wood, Cooperstown, N. Y. Filed April 27, 1883.

279,307. Car-Coupling: Thomas H. Ambrose, Port Hope, Ontario, Canada. Filed March 5, 1883.

279,311. Railway-Car: Charles F. Annan, Boston, Mass. Filed Oct. 5, 1882.

279,312. Car-Coupling: Charles E. Appell, Harrisburg, Texas. Filed March 20, 1883.

279,317. Car-Coupling: James Barrett, Bealsville, Ohio, assignor of a part to Benjamin Dennie, same place. Filed Aug. 16, 1882.

279,321. Car-Coupling: Henry C. Bradley, Camden Point, Mo. Filed April 19, 1883.

279,332. Car-Coupling: George A. Cage, Mineola, Texas. Filed Oct. 30, 1882.

279,338. Steam-Cock and Check-Valve: Jos. A. I. Claudon, Paola, Kans. Filed Dec. 23, 1882.

279,342. Car-Axle Box: Chas. W. Coller, Hannibal, Mo. Filed April 19, 1883.

279,358. Stock-Car: John Dixey, Michigan City, Ind. Filed April 16, 1883.

279,361. Dumping-Car: Charles C. Duffy, Newport News, Va. Filed Nov. 9, 1882.

279,383. Feed-Water Heater for Locomotives: Henry Heaton, Cleveland, Ohio. Filed Feb. 13, 1883.

279,394. Machine for Curving Railroad Rails: William E. Kichline, Bethlehem, Pa., assignor of one-half to Doctor Abraham Stout, same place. Filed Mar. 16, 1882.

279,407. Pumping-Engine: Edwin H. Martin, Cleveland, Ohio. Filed April 19, 1883.

279,416. Car-Coupling: Hermon Moon, Grove City, Pa. Filed May 1, 1883.

279,420. Weather and Fire Strip for Box-Car Doors: George B. Nichols, Galveston, Tex. Filed Oct. 20, 1882.

279,434. Car-Truck: Horace Resley, Cumberland, Md. Filed April 30, 1883.

279,436. Station-Indicator: George Francis Robertson, Taylorsville, Ky. Filed March 17, 1883.

279,463. Railway-Signal: John S. Trites, Moncton, New Brunswick, Canada. Filed March 24, 1883. Patented in Canada Feb. 2, 1883, No. 16,248.

279,466. Car-Wheel: Nathan Washburn, Allston, Mass. Filed April 23, 1883.

279,478. Station-Indicator: Edward S. Boynton, Bridgeport, Conn. Filed March 2, 1883.

279,485. Car-Coupling: Elias C. Galentine, Bourbon, Ind., assignor of one-half to Thomas B. Lee, same place, and Dwight L. Dickinson, Plymouth, Ind. Filed March 29, 1883.

279,486. Heater: Robert Johnson and John F. Buerkel, Boston, Mass., assignors to the Johnson Railway Heater Company, same place. Filed Sept. 28, 1882.

279,506. Car-Axle Box: George W. Sweeney, New York, N. Y., assignor to James Augustus Hamilton, for himself and as Trustee, same place. Filed April 7, 1883.

279,509. Railway-Switch: Frank Vanell, Vincennes, Ind. Filed Feb. 24, 1883.

BEARING DATE JUNE 19, 1883.

279,520. Car-Wheel Chill: Jacob N. Barr, Altoona, Pa. Filed March 8, 1881.
279,544. Slide-Valve for Compound Engines: Edward G. Davis, St. Louis, Mo. Filed April 19, 1883.
279,565. Hand-Brake for Cars: Theodore Hunt, St. Louis, Mo. Filed May 10, 1883.
279,578. Device for Unloading Platform-Cars: George P. Merrill, Toledo, Ohio. Filed May 3, 1883.
279,614. Car-Coupling: Benjamin F. Teal, Paterson, N. J. Filed May 3, 1883.
279,654. Car-Coupling: William H. Lucan, Hermon, Ill. Filed Jan. 19, 1883.
279,658. Car-Coupling: De Witt C. McCallum, Minneapolis, Minn. Filed Nov. 10, 1882.
279,672. Stock-Gate for Railroads: Edgar H. Taylor, Ash Valley, Kans. Filed July 6, 1882.
279,675. Car-Coupling: Samuel G. A. Urquhart, San Francisco, Cal. Filed Feb. 27, 1883.
279,700. Safety-Guard for Railways: Barnad Briody, Detroit, Mich. Filed Feb. 15, 1883.
279,723. Railway Time-Recorder: Albert H. Dean and Stiles H. Whiting, Bridgeport, Conn.; assignors of one-third to Charles A. Gerdenier, same place. Filed Jan. 30, 1883.
279,732. Car-Door Lock: Joseph H. Fisher, Deerfield, Ill. Filed Feb. 27, 1883.
279,736. Rail-Spike: Hervey W. Fowler, Chicago, Ill. Filed Jan. 10, 1883.
279,752. Car-Coupling: William H. Heaverin, St. Louis, Mo., assignor of five-eighths to William H. Calvert and William S. Burroughs, same place. Filed March 16, 1883.
279,763. Car-Coupling: Charles A. Huth, Maynard, Ohio. Filed March 20, 1883.
279,791. Railway-Car: Joseph Parkinson, Danville, Va. Filed April 27, 1883.
279,800. Car-Coupling: Joseph Francis Pryor, Houghton, Mich. Filed Mar. 14, 1883.
279,821. Revolving Car-Signal: Leander W. Schoonover and Joseph Afflerbach, Perth Amboy, N. J. Filed March 13, 1883.
279,831. Link-Protector: Andrew V. Smith, San Francisco, Cal. Filed April 10, 1883.
279,845. Car-Coupling: John D. Vance, Cincinnati, Ohio, assignor of one-half to John J. Le Beau, same place. Filed May 4, 1883.
279,849. Safety-Guard for Railway-Frogs: Jean F. Webb, Lebanon, Ill. Filed Dec. 11, 1882.
279,868. Machine for Unloading Railroad-Cars: Almon Hall, Toledo, Ohio, assignor of one-half to Hosea T. Stock, same place. Filed April 27, 1883.

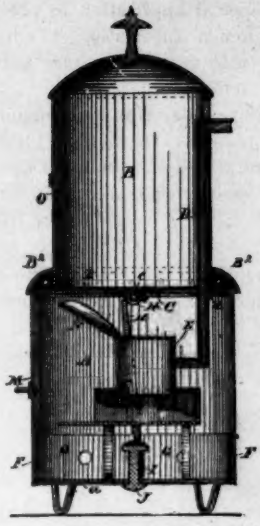
BEARING DATE JUNE 26, 1883.

279,907. Car-Spring: John B. N. Berry, Baltimore, Md. Filed Nov. 1, 1882.
279,911. Car-Coupling: Stephen M. Cate and Charles O. Smith, Bridgeport, Conn. Filed April 2, 1883.
279,914. Car-Brake: Moses M. Clark, New Haven, Conn. Filed Feb. 6, 1883.
279,920. Steam-Boiler: John A. M. Cox, Indianapolis, Ind. Filed Oct. 9, 1882.
279,921. Reversing-Valve: Charles S. Crane, Chicago, Ill. Filed Jan. 23, 1883.
279,924. Bed-Plate for Steam-Engines: John H. Elward, Polo, Ill., assignor to Mary Elward, same place. Filed Oct. 31, 1882.
279,929. Electric Railway-Signal: De Witt C. Farrington, Lowell, Mass. Filed June 5, 1882.
279,950. Construction-Car: Luther K. Jewett, Fitchburg, Mass. Filed Mar. 9, 1883.
279,951. Car-Truck: Luther K. Jewett, Fitchburg, Mass. Filed Oct. 19, 1882.
279,954. Sleeping-Car: Eugene P. Kellogg, New York, N. Y. Filed March 15, 1882. Renewed Nov. 1, 1882.
279,969. Coal-Burning Furnace: Arthur G. Moore, Winton Place, and John W. Rahn, Cincinnati, Ohio. Filed Jan. 17, 1882.
279,999. Car-Brake and Starter: Edmund B. West, Philadelphia, Pa. Filed May 15, 1883.
280,011. Valve Mechanism: John W. Bradley, Stratford, assignor of one-half to the Belknap Manufacturing Company, Bridgeport, Conn. Filed Jan. 23, 1883.
280,016. Car-Coupling: James B. Davis, Washington, D. C. Filed May 8, 1883.
280,027. Rotary Engine: Charles C. Garcelon and William A. Woods, Santa Cruz, Cal. Filed April 21, 1883.
280,029. Oiler for Machinery: Frederick A. Gardner, Buffalo, N. Y., assignor of one-half to R. Dunbar & Son, same place. Filed March 30, 1883.
280,030. Railroad-Rail Cushion and Joint: William F. Gould, Stuart, Iowa. Filed Aug. 4, 1882.
280,038. Packing for Pistons and Plungers: William D. Hooker, St. Louis, Mo. Filed Aug. 29, 1882.
280,041. Revolving-Cylinder Engine: George W. Hunter, Philadelphia, Pa. Filed March 29, 1883.
280,042. Steam-Engine Governor: Samuel E. Jarvis, Lansing, Mich. Filed April 3, 1883.
280,046. Electrical Pilot-Car for Locomotives: Smith H. Knapp and Alpheus E. Adams, Danbury, Conn. Filed Feb. 5, 1883.
280,049. Railroad and Other Ticket Holder and Press: John Loudon, Big Rapids, Mich. Filed Nov. 25, 1882.
280,064. Spark-Arrester: Alexander Mitchell, Wilkesbarre, Pa. Filed May 12, 1883.
280,083. Gas-Engine: Christian Rohn, Hartford, Conn. Filed March 8, 1883.
280,086. Car-Seal: William Scharnweber, Jefferson, assignor of one-half to Frederick K. Bowes, Chicago, Ill. Filed Aug. 26, 1882.
280,087. Car-Axle Box: John Schmelter, Detroit, Mich., assignor of one-fourth to Matthew Stolz, same place. Filed Jan. 31, 1883.
280,091. Chain Driving-Gear for Locomotives, Steamboats, etc.: Gustav F. Sievern, Pittsburgh, Pa. Filed May 2, 1883.
280,096. Balance-Wheel: John B. Tibbits, Hoosick, N. Y. Filed Feb. 3, 1883.
280,103. Cut-Off-Valve Gear: Alexander F. Ward, Detroit, Mich. Filed March 10, 1883.
280,106. Force-Pump: Milo L. G. Wheeler, Oregon City, Oregon. Filed July 17, 1882.
280,110. Metallic Railway-Tie: Sidney B. Wright, Wyandotte, Mich. Filed Dec. 23, 1882.
280,129. Car-Step: Arthur Cameron, Kalamazoo, and Charles E. Russell, Grand Rapids, Mich. Filed April 16, 1883.
280,146. Cutter and Holder for Lathes: Jos. W. Douglas, Middletown, Conn. Filed March 24, 1883.
280,162. Rotary Engine: Moses Fay, Townville, Pa. Filed April 21, 1883.
280,176. Gauge-Cock: Campbell P. Higgins, Philadelphia, Pa. Filed Feb. 5, 1883.
280,179. Car-Signal: Louis C. Huber, Huber, Ky. Filed March 19, 1883.
280,186. Belt-Coupling: Abner Johnston, Cornwall, assignor of two-thirds to Nelson Secor, New York, N. Y. Filed May 9, 1883.
280,188. Coupling for Shafting: John Killip, Allegheny, assignor to Bair & Gazzam, Pittsburgh, Pa. Filed March 5, 1883.
280,194. Rotary Engine: Andrew B. Lipsey, West Hoboken, N. J., assignor to William Bell, New York, N. Y. Filed June 10, 1882.
280,200. Railway Cross-Tie: John Mahoney and David W. Shockley, Wilmington, Del. Filed March 2, 1883.
280,206. Spark-Arrester for Locomotives: Theodore J. McMinn, St. Louis, Mo. Filed Nov. 15, 1882.
280,211. Lathe: Frederick B. Miles, Philadelphia, Pa. Filed Jan. 8, 1883.
280,212. Condenser for Steam-Pumps: William A. Miles, Copake Iron Works, N. Y. Filed Dec. 26, 1882.
280,223. Metallic Shield for Brakemen's Boots: Edward Nelson and Alfred Davis, St. Paul, Minn. Filed April 28, 1883.
280,224. Refrigerator-Car: Peter C. Nissen, Chicago, Ill. Filed April 9, 1883.
280,228. Pulley: Olaf R. Olsen, Indianapolis, Ind., assignor to the Indianapolis Machine and Bolt Works, same place. Filed May 21, 1883.
280,244. Car-Brake: John W. Rice, Springfield, Mass. Filed March 2, 1883.
280,254. Car-Coupling: David E. Southwick, Ogdensburg, N. Y. Filed Jan. 8, 1883.
280,255. Car-Brake: Oscar Spiess, Philadelphia, Pa. Filed April 23, 1883.
280,256. Steam-Engine Indicator: Ladislav Stanek, Prague, Bohemia, Austria-Hungary, assignor to the American Steam Gauge Company, Boston, Mass. Filed March 15, 1883.
280,259. Lathe: Frank M. Stevens and Charles E. Moore, Boston, Mass.; said Moore assignor to said Stevens. Filed Jan. 4, 1883.
280,265. Car-Axle Lubricator: Samuel J. Wallace, Keokuk, Iowa. Filed Mar. 9, 1883.
280,276. Belt-Tightener: James Withington, Chambersburg, assignor to the Trenton Iron Company, Trenton, N. J. Filed March 16, 1883.
280,277. Compound Packing for Hot Journals on Cars, etc.; Madison L. Woodbury, St. Albans, Vt. Filed April 4, 1883.
280,280. Railway-Car: William H. H. Young, Baltimore, Md. Filed Nov. 7, 1882.
280,282. Roller for Endless Belts: Reuben S. Bacon, Springfield, Ohio, assignor of one-half to Edgar J. Pelton, same place. Filed April 21, 1883.
280,307. Railroad-Gate: Geo. A. Hall, Waterford, and Geo. S. Fogg, Westbrook, Me., said Fogg assignor to said Hall. Filed Dec. 15, 1881.
280,311. Valve-Gear for Steam-Engines: Nathaniel G. Herreshoff, Bristol, R. I., assignor to the Herreshoff Manufacturing Company, of Rhode Island. Filed March 12, 1883.
280,312. Steam-Engine Valve: Nathaniel G. Herreshoff, Bristol, R. I., assignor to the Herreshoff Manufacturing Company, of Rhode Island. Filed Jan. 5, 1883.

THE printing of the new English dictionary, which is in preparation in London, has proceeded to the end of the article "alternate," and at that point there are over 6,000 entries, as compared with under 3,000 in Webster. The statisticians connected with the project have calculated that the work will contain nearly 200,000 entries, and that the quotations will reach more than a million in number. The first part of the undertaking will probably be ready for distribution in a few months.

Safety Casing for Railway Car Stoves.

BENJAMIN D. STEVENS, of Burlington, Vermont, has recently secured letters patent for a Safety Casing for Railway Car Stoves. This cut is an illustration of his invention.



The enormous yearly loss of life by burning consequent upon railroad accidents is appalling. The inquiry has been: Cannot something be devised that will save human life in case the car burns. The inventor has answered this question. Not only will his invention, if put into practical use, save human life, but it will also save the car from burning. The cost of one car burned to ashes that would otherwise in case of accident be at most partially injured, not beyond repair, would pay any railroad company for the whole expense incurred in casing their stoves with this device.

One life lost is worth more than it would cost to encase every railway stove in the country. Especially would it seem so to a railroad manager, if a member of his family were the victim.

Now the inventor has devised a simple remedy for all this. The casing can be used in connection with any ordinary car stove. It provides means for automatically closing the draft or air apertures in the event of an accident to the car, or in case of the upsetting or overturning, or tilting of the stove.

The casing is provided with bottom openings for the admission of cold air, and with top openings for the passage of the heated air into a radiator or shell surmounting the safety casing which surrounds the stove. A rotary disk or a sliding register is fitted on the apertured top of the safety casing, and is connected at the top with a spring pressed lever, the lower end of the lever being connected with a ring or band fitted over the air-inlet openings at the bottom of the casing, and provided with openings registering with those in the casing. A smoke-flue carried by the radiator or top shell extends through one of the openings in the top of the casing and connects with the funnel of the stove.

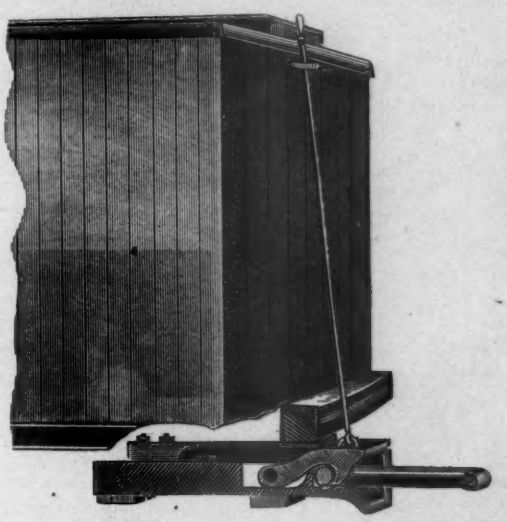
The radiator rests upon the safety casing in such a manner that the smoke-pipe of the former serves as a stop for keeping open the hot-air discharge openings in said casing, so long as the stove is in an upright position.

When the car or the stove is tilted or overturned, the radiator will topple off, and by the removal of its smoke-pipe from the pipe of the stove, bring into action the spring which is connected with the lever heretofore mentioned as being connected with the top rotary disk or sliding plate, and with the ring or band. The force exerted by the spring, serves to move the last named devices for closing all the apertures in the casing, consequently preventing the escape of fire and causing the latter to go out. The inclosure being thus made air tight, the fire is smothered and soon goes out. The radiator or shell called the drum, is composed of sheet metal, and it sets on a base composed of cast-iron or other heavy metal, the object being to have the radiator so heavy that it will rest firmly on the top of the casing, without the use of special fastenings, when the casing remain in an upright position, but as soon as the stove is tilted or overturned, or in the act of overturning, the radiator as before stated topples off and the casing closes up. No ordinary jar or tilting of the car in motion while remaining on the track, will affect the casing or its appliances in their relative positions to each other and the stove. But when the car is thrown from the track, tipped over or partially so, in such a manner as to throw the fire out of the stove, then it is that the radiator topples off, the casing is closed and this device becomes operative.

The casing is constructed of boiler or wrought iron, a material that will not break from receiving blows on its surface, and the apertured top is fitted to the body of the casing by bolts, rivets or other fastenings, so as to admit the stove. The casing may be cylindrical or of any other shape, according as the stove is which it is to cover, and may be made whole or in sections, in which latter case, the parts may be bolted together when the stove is encased; the bottom being close or solid and secured to the floor of the car. A door is placed in the casing, and appropriate means provided for feeding and cleaning the stove, the door being provided with a secure spring lock. All this can be handsomely ornamented and made a neat and pretty article of car furniture. The owners of this valuable patent are the inventor, Giles S. Appleton, and Hamilton S. Peck, of Burlington, Vermont. Correspondence solicited. Address Hamilton S. Peck, Burlington, Vermont.

The Mignauth Car-Coupling.

THE Mignauth Car-Coupling is automatic. A link is engaged and held by a downwardly swinging hook pivoted within the draw-head. The draw-head consists of a longitudinal bar having



its forward end made of flaring form, with a socket to admit one end of an ordinary coupling-link. The head contains in its interior an elevated shoulder, designed to limit the entrance of the link, and prevent it from being carried into the head too far. The opening into which the link fits, is made to retain it in a horizontal position, the upper surface of the opening bearing on top of the link at its inner end. The coupling-hook, which is seated in a longitudinal slot or mortise in the upper side of the coupling-head, is secured within the head upon a horizontal pivot, so that its forward end swings vertically. The forward end of the hook is beveled on the under side, so that it is raised by the action of the coupling-link, as the latter is forced into the draw-head. The nose or shoulder of the hook has its under side rounded to engage the more firmly with the coupling-head, and prevent the hook from working upward, and being disengaged by the vibratory motion of the link within the head, when the car is in motion. The parts are so constructed that the link is held securely in position and prevented from unnecessary end motion. For the purpose of insuring the action of the hook and preventing its accidental disengagement from the link, the inventor applies to the top of the hook a long flat spring, one end of which is secured firmly to the head, while the opposite and forward end bears upon the hook. The hook can be made to be operated from the top of the car, and the necessity of the attendant passing between the car can be avoided, by extending a

rod from the hook upward, through an eye or guide on the end of the car. The mouth of the draw-head and the hook are made so that the hook will certainly enter the draw-head of the next car, when the coupling of the two is to be effected.

Messrs. Mignauth and Bourbonniere, of Lawrence, Mass., are the proprietors of the coupling described.

Artificial Railroad Ties.

A new patent just taken out relates to the manufacture of railroad ties from the fibrous residue of the sugar-cane. The sugar-cane contains a very strong fiber, which becomes almost imperishable when freed from the many injurious agents which we naturally find with it.

The saccharine juice which alone renders the sugar-cane so profitable to the planter, is ordinarily extracted by means of rollers. But by no means does the planter succeed in getting even a fair percentage of the juice, which is contained in the cellular tissue of the sugar-cane. The linings or walls of the cells form what is known as the pith. This pith acts like a sponge, and retains a part of the juice after the cane has been subjected to the crushing pressure of the rollers. It is a well-known fact that, in order to obtain any liquid held in a sponge, if a continued pressure be applied, the result is much more satisfactory than if the pressure be momentary, as is the case with the rollers.

In this new process, the bagasse or fibrous residue is taken and so arranged in a press that the juices which remain, are extracted almost entirely by a continued great pressure. The form into which it is pressed is that of a railroad tie; the proper amount having been placed in the press to render the tie of the most desirable weight and shape. It may be necessary to treat the material chemically before the final pressure is applied; 1st. To prevent the saccharine matter from turning into an acid, which can be done by any neutralizing agent; 2. Perhaps to remove the mucilaginous or waxy matters which may come in as an injurious element, when we consider that the durability of this article is the chief factor which will render it of any practical use. The juice we obtain by this last pressure, may or may not be of any value to the sugar maker. Some claim that it will contain too many impurities to be made even into syrup. But experiment may prove that this is a mistake.

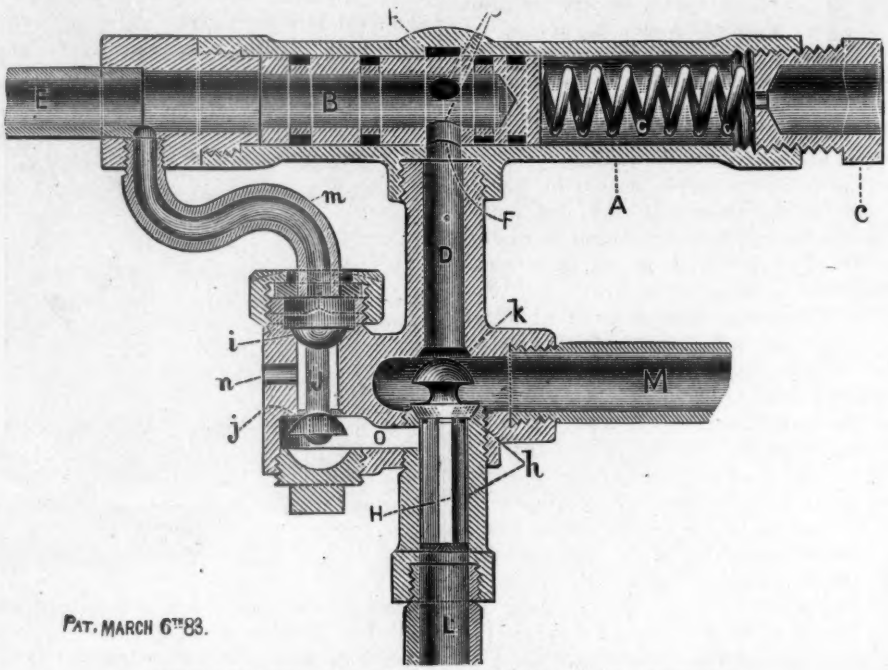
A New Automatic Pressure Governor and Brake Valve.

The accompanying engraving illustrates a recent invention in the line of Pressure Regulators or Governors, lately patented by Mr. George B. Price, of Philadelphia.

The design as shown entire has a special application to pressure air brakes, such as the Westinghouse Automatic. The invention, however, is really divisible into two parts, since part of it may be used without reference to the other.

In order to greater clearness, we will first describe that portion termed strictly the Governor or Reducing Valve, being all that part above the pipe D, the purpose of which is to reduce a constantly changing pressure to a uniformity; that is to maintain a constant prescribed pressure at the outlet E regardless of the excess at D.

It will be seen that this part of the design has reference to a number of cases, being applicable in fact to almost every arrangement where a reduction of pressure is desired, whether of air, gas or steam. The governor, which has a special claim to simplicity and few parts, consists of a cylinder A, into which is nicely fitted a sliding piston valve B; a spring C held in tension by the adjusting cap c, and the necessary pipe connections as at D and E.



PRICE'S AUTOMATIC PRESSURE GOVERNOR AND BRAKE VALVE.

The operation is as follows: Pressure in excess of that to be used is admitted at D; passing through the port and openings at F and G, it enters the hollow of the piston B, and thence to the outlet E; but as soon as the pressure at E equals the tension of the spring C, it forces the piston B back over the ingress port F, so diminishing the supply until the pressure at E has decreased sufficiently for the spring C to further open the ports and so keep up the desired supply.

The remaining mechanism, which is shown in combination with the governor, applies, as before stated, to Pressure Air Brakes. Imagine one of these combinations placed beneath each car in a train. L connects with the main supply pipe; M with an auxiliary reservoir, and E with a brake cylinder. When air is forced back through the supply pipe, it raises the valve H, closing it against its upper seat k, and passing through M charges the reservoir. At the same time, passing into the little chamber o, it lifts the pop-valve J, closing it against its lower seat j. These conditions hold until the pressure is released from L, either by a break in the train or intentionally, when the pres-

sure confined at M, operating on the larger surface of the valve H, closes it against its lower seat h, which opens a passage through D into the governor A, where it is brought to the most desirable pressure; thence to the brake cylinder at E, thus applying the brakes. At the same time the pop-valve J is closed against its upper seat i, by the pressure now in the pipe m.

When the brakes are to be released, pressure is again forced through L, acting as before described, recharging the auxiliary reservoir, and raising the the pop-valve J, allowing the pressure confined in the brake cylinder to escape through the pipes E and m and the hole n into the atmosphere.

The mechanism as applied to brakes may be used without the governor A if preferred, in which case the full power confined at M will be exerted on the brake piston; but as this has several objections, as the locking of wheels for example, the interposition of the governor is recommended, by which an equable pressure is maintained, and a considerable surplus held in reserve to make up for leakage in the brake cylinder.

The Lightfoot Cattle Car.

THE main features of this device have been patented. Its inventor thinks that metal would be lighter than wood for the body of the car, and perhaps not much if any more expensive.

The frame of the car may be made of angle, T, or channel iron, of wood, or of both wood and iron. Cattle stand lengthwise of the car, head to head and tail to tail, three abreast and in tiers, or eighteen animals per car, leaving nearly three feet width to each. They stand in stalls, each one of which is secured in place by movable bars of wood fastened by mortise at one end and button and hinge at the other end. The cattle enter by six doors. The head ends of the stalls are close up to the height of the head. The bottom board, which may be stationary, is two inches above the floor and twelve inches wide, so as to prevent legs getting under or over in lying down.

Feeding and watering are effected by means of galvanized iron troughs, two feet wide at the top and running half way across the car. These are set low so as to allow the animal's head in a safe position, lying or standing over it. The troughs are connected with tank and food reservoirs, which can be made to run the whole length of the car, if so desired, and which can be supplied with sufficient for the needs of the animals before starting or *en route*. The floor up to the edge of the urinary in front, may be of wood to stand on, also wood under hind feet. Said urinary is of perfected cast-iron, of dish shape, about two inches deep and of twenty inches diameter. The receptable for manure is a cast-iron trough, two inches deep, eight or twelve inches wide and hung on hinges so as to be emptied thoroughly; and under it, to prevent the cattle getting their feet through, are half-inch round iron rods, two inches from center to center and allowing the manure to be discharged readily. This arrangement for disposing of the droppings of the animals, is supplied with faucets connected with the water tank, so as to be thoroughly cleanable. The doors at the two middle tiers of stalls open back to back, so as to form guides to animals going into their places, and to be out of the way. They are hung on heavy hinges and fastened shut by bars across the whole, set on heavy iron loops or pockets, one of them open at the top, for the bars to drop in easily and hold it securely. To protect the animals from severe cold or storms, the cars up to near the height of heads may be supplied with canvas hung on rollers, and drawn up or down as the comfort of the animals may require.

Standing longitudinally with the direction of motion the animal has the means of bracing himself on recovery from sudden starting and stopping of train, which he has not when standing across the line of motion, and hence, by the old method, is often thrown down and, being unable to recover, is trampled to death or injured as beef for the table.

The above, with slight verbal changes, is Mr. Lightfoot's plan as described by him and submitted to the Humane Association, in the year 1880. The inventor insists that if the comfort and condition of animals during transportation are objects of importance, the cattle must have room to lie down. Should it be objected that the car as described is too long for safety, one set of middle stalls can be omitted, reducing the number of animals carried to twelve, and the length of the car from forty-eight to thirty-two feet. He proposes as food for cattle during transportation, oats or cut feed, to be served through the conveyers from top of car. Water can be supplied in the same troughs through pipes connected with the water tank of the car. If found expedient the receptacles for manure might be dispensed with, allowing droppings to pass through the iron-rod intervals above described. Mr. Lightfoot's address is Media, Penn.

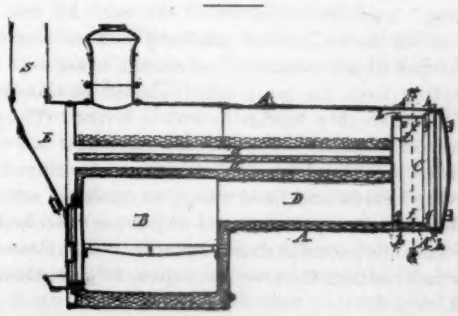
New Car-Brake.

CHARLES W. SMITH, of Coalesburg, Missouri, has invented a new specimen of that class of car-brakes in which the brakes are applied by the momentum of the cars. The letters patent granted to him secure him the combination, with a rigid axle-pinion, of a rotary shaft carrying a rigidly-attached pinion and lever, a chain connected with the brake mechanism, and a pinion journaled on one side of the lever, whereby the lifting of a lever will cause the brake mechanism to be applied; also the combination, with a windlass-chain and brake-lever, of a rod and cylinder containing a spring, said cylinder being pivoted at one end to a lever and suspended at the other flexibly from the car, whereby the brakes will be applied with a yielding pressure, and not by a sudden shock; and a brake consisting of three cog-wheels and a winding-shaft, in combination with a chain, rod, cushion-cylinder, brake-lever, rods, and lever, by which one cog-wheel is put in and out of gear with another cog-wheel.

G. A. Porter Steam Boiler.

PATENTED MARCH 6, 1883.

MANUFACTURED BY THE PORTER MANUFACTURING CO., LIMITED, SYRACUSE, N. Y.



THIS invention relates to that class of steam boilers which are termed "return-flue boilers." In such boilers the products of combustion pass from the furnace or fire-box, through a main direct flue, to the so-called "combustion-chamber" at the rear end of the boiler, and thence back through return-flues in the boiler to the smoke-box and stack on the front end of the boiler. The combustion-chamber of said boiler, especially when straw and other light fuel is used, is usually subjected to such intense heat as to necessitate the protection of its shell by a water-jacket surrounding the same. It is this water-jacket to which the invention has special reference, the object of the invention being to simplify and cheapen the construction, and at the same time give it a form which shall afford the maximum stability, and dispense with the use of stay-bolts heretofore employed for sustaining the crown-sheet of the combustion-chamber.

A, represents the shell of return-flue boiler; B, the furnace or fire-box; C, the combustion-chamber, communicating with the fire-box by the large direct flue D, extended longitudinally through the water-space of the boiler; and E denotes the smoke-box, receiving the products of combustion from the combustion-chamber C, through return-flues a a, extended through the boiler in the usual manner, the stack S being mounted on the smoke-box for the escape of the products of combustion.

The steam and water jacket b, is formed around the combustion-chamber C in the following manner: The flue sheet d, is made of a smaller diameter than the interior of the boiler shell, so that when placed in its requisite concentric position in the shell it will be isolated therefrom, and with an opening around the edge of the flue sheet. The edge of the flue sheet is formed with the usual outward flange e, and on to the exterior of this flange is riveted a supplemental shell f, of cylindrical form, extended to the end of the shell and joined therewith by the flare g. By this construction is obtained the desired steam and water jacket b, around the combustion-chamber C, in a very simple and comparatively inexpensive manner, forming only two joints and seams of rivets, which are convenient of access for caulking and tightening.

Safety Doors for Cars.

Joseph Parkinson, of Danville, Virginia, has invented and patented what he believes to be an effective means of escape from a railway-car, other than the usual end doors. In the event of a collision between trains, the telescoping of the cars and the abutting timbers at their ends are liable to obstruct exit in the ordinary way; and in the case of fire, the occupants frequently perish for want of some other ready means of egress. Mr. Parkinson's invention is intended to obviate these disadvantages. It consists in combining with one or more side doors, peculiar means for holding them normally closed and fastened, and for facilitating escape by such doors if the cars should be standing on a bridge or on a declivity. The side doors open anywhere in the length of the car. They open outwardly, and are hinged at the bottom, so as to drop down as a gang-plank. While not in use they are kept firmly closed against accidental opening and "chattering" from the vibration of the car. In case of accident, the doors can be lowered gradually without slamming, by means of ropes which are made long enough to assist passengers in descending from the car in case it should be standing in an elevated place, as on a bridge or over a ravine. The patentee claims the combination, with a railroad passenger car, of a side door having a screw-nut or socket therein, and a hinged plate or frame having a screw and hand wheel, or crank for securing the doors; also the ropes, the uses of which are described above.

Mr. Parkinson's patent is dated June 19, 1883. Persons wishing fuller information than we have space to give, should write him for it.

The Phosphor-Bronze Smelting Co., Limited, of Philadelphia, are largely supplying phosphor-bronze as a substitute for iron, brass, copper, and German silver, in mining and marine pumps, and machinery for piston rods, valves and valve stems, bolts and nuts, wire-cloth, wire-ropes, etc.; in electrical apparatus, for springs, screws, telephone and telegraph wire; in sanitary appliances, locks, hinges, wood screws, machine screws, hardware, and all purposes wherein great strength and durability are desired. This alloy is described as unequaled among alloys for tensile strength, toughness, rigidity and resistance to crystallization and corrosion. It is made entirely without the use of easily corroded metals, such as zinc, and is found not to be affected by rapid deterioration from galvanic action when exposed to dampness or the corrosive action of sea air, sea and mine water, and other like influences.

Safety Guard for Railway Frogs, Etc.

Among letters patent newly issued at Washington, is one to Jean F. Webb, of Lebanon, Illinois, on account of his improvement in safety guards for railway frogs, etc. It consists, first, in slitting the guard, and, secondly, in providing it with a solid base. While it is not new to provide railway frogs, etc., with elastic safety guards, and to provide these with central longitudinal grooves, the inventor claims an elastic filling for said frogs, etc., having longitudinal slits to receive the flanges of the wheels; and an elastic filling, in combination with a solid base plate. An advantage of Mr. Webb's improvement, experienced in winter time, is in preventing the frog from getting packed solidly full of ice and snow. If snow get on it is easily swept off, and if sleet or rain form a crust over it, the moment a wheel strikes it, the rubber gives way beneath, and the ice is crushed to pieces.

James S. Bailey, of York, Penn., believes that he has one of the simplest and cheapest Car-Couplers ever invented and patented. It can be applied to most freight cars in use, and will accomplish coupling without the brakeman having to hold the link or drop the pin. He simply sets the combination. This takes but a few seconds and no attention is needed afterwards. The combination, including bolts to fasten on the drawhead, weighs about six and a half pounds. The hook for carrying link, and the holder for supporting pin, can be changed from one car to another. In case cars are of different heights, the pin-holder should always be on the highest car. There is no strain on any part of the combination, more than carrying link and pin. When the cars come together in making a coupling, the bolts slide back just enough to allow the face of drawhead to come together. In case of drawhead pulling out, there is nothing broken, as there is no part fastened to the body of the car. As to the cost of his patent, Mr. Bailey says that if companies would manufacture its parts themselves, it would be very small as compared with the cost of some now in use.

Improvements in the Canadian Patent Laws.

An amendment to the patent act has been recently passed in Canada, defining the duration of a patent to be fifteen years, subject to the payment of a government fee of $20 before the expiration of the first and second periods of five years. Patentees, however, have the option of paying the entire government fee for fifteen or for ten years before the issue of the patent.

This act, while not affecting the administration of the patent laws of the dominion, is a decided improvement. Formerly a patent was granted for five years, with the option of renewing or extending it for five or ten years more on payment of a fee of $20 for each five years. This had the effect that the United States court decided that the subsequent extension was a distinct and separate grant, and hence it shortened the life of the United States patent if issued subsequent to the grant of the Canadian patent, to the remainder of the five years of the life of the latter. Henceforth, each Canadian patent will be issued for fifteen years.

The patent office is also preparing a new form of patent, which will be less cumbersome than the old rather awkward and clumsy parchment. It will be modeled somewhat after the form and size of the United States patent, with certain improvements taken, it is understood, from the German pattern.

The business of the patent office at Ottawa is increasing from month to month, and is at present somewhat crowded, agents and patentees experiencing a good deal of delay in the allowance of their grants. Taken in all, there is yet plenty of room for improvement in the internal organization of the office, though it cannot be denied that progress is being made.

Chicago, Milwaukee and St. Paul Railway.

THE earnings of the Chicago, Milwaukee and St. Paul Railway Company for the years ending December 31, 1881 and 1882, were as follows:

	1881.	1882.
From freight	$11,884,795 53	$14,002,335 25
From passengers	3,938,988 77	5,179,078 04
From mail service	376,535 31	411,569 05
From express service	286,089 32	352,374 02
From news service	8,613 70	12,582 54
From rents	8,428 81	13,873 80
From telegraph	8,136 77	6,838 46
From extra baggage	26,046 55	38,034 91
From sleeping cars	105,625 53	141,670 74
From stock yards	63,387 26	73,545 37
From milk	31,313 35	36,852 18
From elevator "A"	77,564 77	17,357 97
From elevators "B" and "C"	104,709 19	30,313 45
From elevator "E"	71,283 44	43,014 79
From elevator, Minneapolis	34,943 36	27,285 29
Total earnings	$17,025,461 66	$20,386,725 86
Expenses, viz:		
Repairs of track	$1,542,590 51	$1,702,876 98
Repairs of bridges	184,428 78	285,850 25
Repairs of fences	67,093 72	65,075 51
Repairs of buildings	224,310 31	204,514 25
Repairs of locomotives	566,970 97	827,911 08
Repairs of cars	699,326 18	1,042,901 65
Repairs of tools and machinery	101,376 56	128,690 63
Renewal of track	341,370 04	221,112 30
Management and general officers	296,646 44	348,615 24
Foreign agency and advertising	111,008 04	181,356 45
Station service	1,388,650 64	1,677,599 53
Conductors, baggagemen and brakemen	724,473 27	937,156 62
Engineers, firemen and wipers	1,047,360 59	1,245,353 54
Train and station supplies	346,801 00	356,282 19
Fuel consumed	1,581,198 00	1,605,057 00
Oil and waste	173,687 24	228,222 37
Personal injuries	114,856 02	122,304 50
Damages to property	45,170 25	54,999 31
Loss and damage of freight and baggage	36,746 59	41,012 58
Legal expenses	53,714 37	70,441 24
New York office expenses	14,901 17	15,662 37
Taxes	473,166 43	589,613 80
Insurance	35,544 99	70,402 03
Miscellaneous expenses	65,367 33	93,609 05
Stock yard expenses	15,294 92	15,076 33
Expenses elevator "A"	21,193 14	10,324 33
Expenses elevators "B" and "C"	20,001 38	15,999 17
Expenses elevator "E"	19,453 54	18,710 73
Expenses elevator, Minneapolis	5,228 63	9,342 18
Total expenses	$10,317,931 14	$12,186,073 21
Net earnings	$6,707,530 52	$8,200,652 65

The entire net income of the company for the year ending December 31, 1881 (including $4,343,283.16 balance from previous year, $324,112.14 from interest and other income and profits, and $311,196.23 cash received for sales of land), was $11,686,122.05; and the disbursements were: for dividends on preferred and common stock, April 15 and October 15, 3½ per cent. each, $1,965,722.08, and for interest on bonds $4,127,389.12—leaving a balance December 31, 1881, of $5,593,010.85.

The entire net income for the year 1882 (including the $5,593,010.85 balance from 1881, $109,604 premium on bonds and stock, $38,358.04 dividend on St. Paul and Duluth Railroad stock, and $475,851.58 cash received for sales of land), was $14,417,477.12; and the disbursements were: for dividend on preferred and common stock, April 15 and October 16, 3½ per cent. each, $2,461,042.08, for interest on bonds $4,786.053.50, and for income applied toward payment for 71,019.48 shares common stock taken at par by shareholders *pro rata* in October, November and December, $3,550,974—leaving a balance December 31, 1882, of $3,619,407.54.

The length of road owned December 31, 1881, was 4,217 miles, and the average number of miles operated during the year, 3,830; at the close of the year 1882 the number of miles owned was 4,520, the average number of miles in operation having been 4,296—showing an increase in miles owned of 303, and in miles operated of 466.

At the close of the year 1881, (there having been added during the year, 103 locomotives and 3,398 cars of all descriptions) the company had 526 locomotives, 207 passenger, 27 sleeping, 6 parlor, 135 baggage, postal, mail and express, 11,036 box, freight and caboose, 1,419 stock, 4,286 flat and coal, and 32 wrecking and tool cars; and at the end of the year 1882 (100 locomotives and 5,258 cars having been added during the year), 626 locomotives, 240 passenger, 33 sleeping, 6 parlor, 6 dining, 176 baggage, postal, mail and express, 12,006 box freight and caboose, 2,364 stock, 4,154 flat and coal, and 33 wrecking and tool cars.

The number of miles run by passenger trains during the year 1882 was 4,495,232; by freight trains, 11,689,802; by wood and gravel trains, 2,120,287—total, 18,305,321, against 14,966,530 during the year 1881, an increase of 3,338,891.

The number of passengers carried in 1882 was 3,956,814, against 2,985,885 in 1881, an increase of 2,932,706; and the number carried one mile in 1882 was 200,790,926, against 137,940,086 in 1881, an increase of 62,850,840.

The number of tons of freight moved in 1882 was 5,127,767, against 4,276,088 in 1881, an increase of 851,679; and the number moved one mile in 1882 was 945,250,159, against 697,347,607 in 1881, an increase of 247,902,552.

The amount received per passenger per mile in 1882 was 2.58 cents, against 2.86 cents in 1881; and the amount received per ton per mile in 1882 was 1.48 cent, against 1.70 cent in 1881.

The earnings per mile run, on freight, in 1882 was $1.20, and in 1881 $1.22; do., on passengers, in 1882 $1.15, and in 1881 $1.13. The expenses per mile run, including all expenditures, was in 1882 $0.75, and in 1881 $0.78.

The gross earnings of the road for the year ending December 31, 1880, were $13,086,118.61, the total expenses $7,742,425.68, and the net earnings $5,343,692.93—showing an increase in the earnings of 1881 over those of 1880 of $3,939,343.05, with an increase in expenses of $2,575,505.46, making the increase in net earnings $1,363,837.59. Compared with the year 1881, the gross earnings of 1882 show an increase of $3,361,264.20, the total expenses an increase of $1,868,112.07, and the net earnings an increase of $1,493,122.13. The percentage of expenses to earnings was in 1881 60.6, and in 1882 59.8. The gross earnings per mile of road operated in 1881 were $4,445.29, and the net earnings $1,751.31; in 1882 the gross earnings per mile of road operated were $4,745.51, and the net earnings $1,908.90. The extraordinary expenditures during the year 1881 amounted to $4,744,569.38 against $4,978,286.17 during the year 1882.

During the year 1881 branches and extensions were constructed as follows:

In the State of Illinois a line from Rockton to Rockford, 16 miles; and the Braceville coal track, one mile.

In the State of Wisconsin, a line from Mazomanie on the Prairie du Chien division to Prairie du Sac, 10 miles; and from Monroe to Shullsburg, 34 miles.

In the Territory of Dakota, the Iowa and Dakota division was extended to the Missouri River at Chamberlain, 13 miles; the Southern Minnesota division from Dell Rapids to Sioux Falls, 19 miles; the Hastings and Dakota division west to Aberdeen, 30 miles, and thence up the James River north from Aberdeen 40 miles, and its Whetstone branch northwest from Millbank Junction, 11 miles. There were also constructed in the James River Valley, south from Aberdeen, 33 miles of track; and on the line west from Flandreau 22 miles from Madison to Howard City.

In the State of Iowa, a branch was constructed from the Iowa and Dakota division at Emmetsburg northwest 15 miles; and the Chicago and Pacific Western division was extended west towards Council Bluffs from Marion, 198 miles, leaving 64 miles of track to be laid.

The aggregate construction during the year amounted to 442 miles, which, added to the 3,775 miles previously owned by the company, made it the owner at the close of the year 1881 of 4,217 miles of completed road, of which 1,239 miles were laid with steel rails, 418 miles having been laid during the year. The average number of miles operated during the year, as previously stated, was 3,830.

During the year 1882, the Chicago and Pacific Western division was completed to Council Bluffs, 64 miles, making a continuous road 488 miles in length from Chicago to a connection with the

Union Pacific and other roads at the Missouri River. A branch was also constructed on the Iowa and Dakota division from Spencer to Lake Okoboji, 17 miles; and the Emmetsburg branch was extended 7 miles to Estherville. The Volga river branch of the Dubuque division was completed to West Union, the county seat of Fayette county, 14 miles. Of the line from Cedar Falls to Ottumwa, 2 miles were completed and 10 miles graded ready for the track. The narrow-gauge road, formerly owned by the Iowa Eastern Railroad Company, extending from Beulah, on the Iowa and Minnesota division, to Stulta, 15 miles, was purchased and changed to standard gauge. These add 119 miles to the company's lines in Iowa.

In Wisconsin, a branch was constructed from Brandon on the Northern division, to Markesan, 12 miles; and the railway of the Chippewa Valley and Superior Railway Company, extending from Wabasha, Minnesota, to Eau Claire, Wisconsin, 50 miles, including a bridge across the Mississippi River, with a branch from Red Cedar Junction to Cedar Falls, 21 miles, was purchased. These add 83 miles to the company's lines in Wisconsin.

In Illinois, a branch 3 miles in length was constructed from Galewood, on the Chicago and Pacific division, to Dunning.

In Minnesota, a branch was constructed from a point on the River division, near Hastings, to Stillwater, 25 miles; and a line from Northfield, on the Iowa and Minnesota division, to a point near Red Wing on the River division, 32 miles. These add 57 miles to the company's lines in Minnesota.

In Dakota, a road was constructed from Yankton, on the Sioux City and Dakota division, to Scotland, on the Running Water branch of the Iowa and Dakota division, 27 miles; and one from Mitchell, on the main line of the Iowa and Dakota division, north to Letcher, 14 miles. These increase the mileage in Dakota 41 miles; and make a total increase of 303 miles during the year 1882, which, added to the 4,217 miles owned by the company at the close of 1881, make it the owner of 4,520 miles of completed railway. As previously stated, the average number of miles operated during the year was 4,296.

The short pieces of road constructed in Dakota, from Yankton to Scotland and from Mitchell north, are in what is known as the James (or Dakota) River Valley, and are intended to form parts of the line of this company, extending north from Yankton through the same. During the year 1881 73 miles of this line were constructed from Ellendale to Ashton, and connect with the Hastings and Dakota line at Aberdeen. The distance from Ashton to Letcher is 75 miles, and from Mitchell to Scotland 45 miles. The construction of these two links would give the company a continuous line from Sioux City and Yankton through said valley to within 65 miles of the Northern Pacific Railroad.

During the year 1881 the preferred stock was increased $1,997,000 by the conversion of mortgage bonds into stock; and the common stock was increased $5,000,000, which was issued at par to the stockholders who subscribed for the same, making the total amount of capital stock at the end of that year $34,805,744. At the same date the amount of mortgage bonds (including $1,109,745 bonds of the Wisconsin Valley Railroad Company) was $80,168,745, making the total amount of stock and bonds $114,974,489, representing the entire cost of the property of the company, including the 4,217 miles of road, the rolling-stock, depot grounds, cattle yards, elevators, warehouses, docks and coal lands, being equal to $27,264 per mile.

The preferred stock of the company was increased during the year 1882 $2,046,000 by the conversion of mortgage bonds into preferred stock; and the common stock was increased $7,500,000, of which $7,101,948 was issued at par to the stockholders who subscribed for the same, one-half payable in cash and one-half charged to income account, making the total amount of capital stock at the close of that year $44,351,744. At the same time the mortgage bonds (including all liens on purchased roads) amounted to $89,635,500, making the total amount of stock and bonds $133,987,244, which represents the entire cost of the 4,520 miles of road, including rolling-stock, depot grounds, etc., being at the rate of $29,643 per mile of road.

The net receipts to the treasury of the company from sales of land during the years 1881 and 1882 were $1,224,364.38, and the amount now due to the company on contracts and mortgages, as shown in the annexed general account, is $1,787,508.90; in addition to which the sum of $210,000 is held in trust to abide the decision of a suit now pending on appeal in the U. S. Supreme Court.

The amount expended by the company during the year 1881 for real estate for yard, dock and depot purposes in Chicago, Milwaukee, Minneapolis, St. Paul and other points was $575,428.35; which amount was increased during the year 1882 by the sum of $259,320.03. The company have also purchased during the past two years 5,539 acres of coal lands in the States of Illinois and Iowa, at a total cost of $730,641.81. These mines furnished during the year 442,134 tons, being about two-thirds of the consumption for the year, and are deemed capable of yielding a full supply for all the requirements of the company.

GENERAL ACCOUNT, DECEMBER 31,

	1881.	1882.
Cost of road	$120,073,629 99	$137,631,949 12
Minnesota Midland Railway	381,122 63	383,150 38
St. Paul and Duluth Railroad stock	716,480 00	716,480 00
Illinois and Iowa coal lands	503,118 92	689,578 05
Minneapolis Eastern Railway	80,414 56	97,064 56
Milwaukee Land Company	.....	85,389 56
City of Hastings bonds	7,700 00	7,700 00
Clear Lake Park Association bonds	3,000 00	3,000 00
Council Bluffs Union Elevator stock	20,833 33	41,666 67
St. Paul Union Depot Company	41,425 00	51,600 00
St. Paul Warehouse and Elevator Company	21,006 00	21,006 00
Oshkosh & Mississippi River Railway bonds	209,598 53	.....
Hastings and Stillwater Railroad	201,443 20	.....
Stock of material on hand	1,028,763 99	1,495,112 82
Balances due from agents and other companies	315,244 68	226,986 62
Miscellaneous accounts (current balances)	347,396 27	345,137 82
Bills receivable	1,000 00	1,600 00
Bills receivable for sales of land	.....	1,787,508 90
Cash due on stock subscription	1,129,215 00	.....
Cash on hand	555,200 93	2,969,732 42
Total	$125,636,593 03	$146,554,662 92
Capital stock, preferred	$14,401,483 00	$16,447,483 00
Capital stock, common	20,404,261 00	27,904,261 00
Consolidated mortgage bonds	11,738,000 00	11,083,000 00
First mortgage La Crosse Division bonds	5,673,000 00	5,372,000 00
First mortgage Iowa and Minnesota Division bonds	3,431,000 00	3,201,000 00
First mortgage Prairie du Chien Div. bonds	3,674,000 00	3,674,000 00
Second " " " "	1,300,000 00	1,241,000 00
First mortgage Chicago and Milwaukee Div. bonds	2,494,000 00	2,393,000 00
First mortgage St. Paul (or River) Div. bonds	3,998,000 00	3,805,000 00
First mortgage Iowa and Dakota Div. bonds	558,000 00	541,000 00
First mortgage Iowa and Dakota Div. Extension bonds	3,814,000 00	3,505,000 00
First mortgage Hastings and Dakota Divison bonds	97,000 00	89,000 00
First mortgage Hastings and Dakota Division Extension bonds	5,290,000 00	5,290,000 00
First mortgage Southwestern Division bonds	4,000,000 00	4,000,000 00
First mortgage La Crosse and Davenport Div. bonds	2,500,000 00	2,500,000 00
First mortgage Chicago and Pacific Div. bonds	3,000,000 00	3,000,000 00
First mortgage Chicago and Pacific Western Division bonds	9,200,000 00	14,380,000 00
First mortgage Southern Minnesota Division bonds	7,203,000 00	7,432,000 00
First mortgage Mineral Point Division bonds	2,160,000 00	2,840,000 00
First mortgage Dubuque Division bonds	6,152,000 00	6,710,000 00
First mortgage Wisconsin Valley Div. bonds	1,700,000 00	1,700,000 00
First mortgage Wisconsin and Minnesota Div. bonds	.....	3,335,000 00
First mortgage Chicago and Lake Superior Division bonds	.....	1,360,000 00
Second mortgage bonds	387,000 00	387,000 00
Land grant income bonds	352,000 00	318,000 00
Minnesota Central Railroad bonds	123,000 00	123,000 00
Milwaukee and Western Railroad bonds	215,000 00	215,000 00
Wisconsin Valley Railroad bonds	.....	1,106,500 00
Oshkosh & Mississippi River Railway bonds	.....	35,000 00
Land department	.....	1,787,508 90
Incumbrances assumed	6,755 00	6,755 00
Bills payable	2,490,397 40	2,712,038 48
Unpaid vouchers and pay-rolls	2,161,108 85	2,216,629 84
Miscellaneous accounts (current balances)	1,401,850 01	2,141,616 27
Dividends and interest unclaimed	118,726 92	83,162 89
Income account	5,593,010 85	3,619,407 54
Total, as above	$125,636,593 03	$146,554,662 92

The office of the company is at Milwaukee, Wis. The officers and directors are:

President—ALEX. MITCHELL.

Vice-President—JULIUS WADSWORTH.

Second Vice-Pres't—JAMES M. MCKINLAY.

Directors—Alex. Mitchell, Julius Wadsworth, Selah Chamberlain, Jeremiah Milbank, Abraham R. Van Nest, James T. Woodward, Wm. Rockefeller, Peter Geddes, Hugh T. Dickey, James Stillman, John Plankinton, S. S. Merrill, Jason C. Easton.

General Manager—S. S. MERRILL.

Secretary—P. M. MYERS.

Treasurer—R. D. JENNINGS.

Gen'l Pass. and Ticket Agent—A. V. H. CARPENTER.

Gen'l Freight Agent—A. C. BIRD.

Purchasing Agent—JOHN T. CROCKER.

General Superintendent—J. T. CLARK.

The Sawyer-Man System of Electric Lighting.

THE Consolidated Electric Light Company, which has its factory at 127 and 129 Front street, Brooklyn, N. Y., and its executive office in the Duncan Building, 11 Pine street, New York City, owner of the Sawyer and Man, and other patents, and of a system of electric lighting based thereon, has brought suits against the Edison Electric Light Company, the Brush-Swan Electric Light Company, the United States Electric Light Company, and all other leading electric light companies and some of their customers; in all, some eight or ten suits, for alleged infringement of patents owned by said company, and which, it claims, are the foundation of the whole system of electric lighting. This announcement is one of great interest to the whole public, and decisions in the suits brought will be awaited with anxiety. The patents owned by the Consolidated Electric Light Company are about sixty in number, but the foundation patents, it alleges, are only five or six in number, and cover inventions made by Wm. Edward Sawyer and Albon Man. The company was organized under the laws of the State of New York, on the eighth day of September, 1882. In March, 1883, it owned fifty-one patents, with other inventions of great value, not then patented, but with respect to which applications for patents have been made and allowed. Application for one patent is still pending, in interference with Mr. Thomas A. Edison.

AUTOMATIC CUT-OFF.

Among the patents owned by the company, is that on the Automatic Cut-off or Fusible Plug, invented by William E. Sawyer and Albon Man, embraced in patent No. 205,303, issued to them June 25th, 1878, and reissued 10,134, and of which the seventh claim reads as follows: "In an electric system, an electrical apparatus energized by the current flowing in such system, which, when there is an abnormal flow of current in a part or parts of such system, automatically operates to disrupt, disconnect, or change the circuit of such part or parts." This general description is sufficient to show that the invention meets the requirements made by the New York Board of Fire Underwriters, who, on the 12th of January, 1882, adopted the following rule: "Wherever a connection is made between a larger and a smaller conductor, at the entrance to or within a building, some approved automatic device must be introduced in the circuit of the smaller conductor, whereby it shall be intercepted whenever the current passing through it is in excess of its safe carrying capacity." It appears that Mr. Thomas A. Edison filed applications for a patent for the same invention, which were rejected because of the prior invention and patent to Sawyer and Man. The Consolidated Electric Light Company publishes, with documentary evidence to sustain it, the charge that notwithstanding this, the Edison, United States, Brush-Swan and other companies use the Sawyer and Man Safety Switch.

AUTOMATIC ELECTRIC SAFETY SWITCH.

Other violations of Sawyer and Man's patent, No. 205,303, issued June 25th, 1878, and reissue 10,134, are also alleged. This patent refers to a device called the Automatic Electric Safety Switch or Automatic Shunt, which throws out of circuit any arc light or incandescent lamp endangered by a too intense current of electro-motive force. The provision stated seems to be the only means whereby two or more lamps, arc or incandescent, can be commercially used in series. The Consolidated Electric Light Company alleges that thirty thousand violations of this patent are in existence. Similarly it is alleged that the Automatic Regulator, of Sawyer and Man, patent No. 205,305, issued June 25th, 1878, which automatically checks an excessive flow of current, is violated in no fewer than twelve hundred instances.

AUTOMATIC REGULATOR.

The Board of Fire Underwriters further require that, "Means by which those in charge of the dynamo electric machines will be warned of any excessive flow of current, or means whereby the same will be automatically checked, must in all cases be provided." The only practical mode of controlling an "excessive flow of current" is by an automatic check or regulator; for the human eye or hand cannot be warned in time to avoid a "lightning flash." This requirement is described as fully met by the Automatic Regulator invented by Sawyer and Man, for which patent No. 205,305 was issued to them June 25th, 1878. The said regulator operates not only to indicate and check the current automatically, but also to regulate the supply of steam or other power whereby the electric current is generated. These features of the system are covered by the patent last cited as follows: 1st. "In an electric regulator the combination of two paramagnetic parts, operating substantially as described." 2d. "In an electric lighting system, a generator of electricity, two or more electric lamps, supplied thereby, and an independent electro-magnetic switch or regulator, energized by the current from the generator and acting automatically, upon the occurrence of any change of electrical condition in the circuit or circuits supplied, to allow of corresponding change in the quantity or intensity of the current generated." This is a broad foundation patent, and is said to be infringed by the Brush Electrical Company, the Edison Electric Light Company, the United States Electric Lighting Company, and all others using an automatic magneto-electric governor or regulator for any of the purposes above described.

THE CARBON AND PROCESS OF TREATING CARBONS.

In the system of Incandescence Lighting, adopted, after much experiment, by the Consolidated Electric Light Company, a peculiar carbon is used, covered by certain letters patent, issued to Sawyer and Man, from June 18th, 1878, to June 29th, 1880. The object of the invention as specified and claimed in these patents is to manufacture a new carbon for incandescence electric lights, and the invention consists, 1st. In electrically heating the illuminating electrode to incandescence, in the presence of a hydrocarbon, which is thus decomposed, and the carbon of which, set free, becomes deposited upon, incorporated with, and permeates the incandescent electrode, producing a new and improved illuminating conductor composed of "consolidated carbon," created by electric action, thus changing the essential characteristics of the original carbon. 2d. In electrically heating the illuminating conductor and connections in the lamp to incandescence, in vacuo, or in the presence of an inert gas, after the conductor is put in the lamp, but before the lamp is finally sealed, for the purpose of "driving out all impurities and occluded gases" contained in the conductor or electrodes. This method of making and treating the illuminating conductor is broadly covered by the patents above recited, and is said to be infringed in either one or both processes by all of the companies engaged in the manufacture of incandescence electric lights.

THE LIGHTING SWITCH.

To prevent the carbon from becoming too suddenly heated, and to obviate the disturbing influence of great changes in resistance which accompany the lighting and extinguishing of a lamp, which often destroys the carbon, the Consolidated Electric Light Company will use the lighting switch or "lamp-lighter," invented and patented by Sawyer and Man, June 25th, 1878. It operates by gradually transferring the current from one closed circuit to another, the effect of which is to gradually illuminate or gradually extinguish the lamp as desired. This invention is broadly covered by this patent; is applicable to both arc and incandescence systems, and is said to be directly infringed by the other electric light companies.

LAMP CONNECTIONS.

The electrical connection between the lamp and the terminals of the conductors leading from the generator is specified and broadly claimed in patent No. 210,809, dated December 10th, 1878, issued to Sawyer and Man, which covers the means of electrically connecting the lamp with a chandelier or bracket. From personal examination of specimens of lamps used by other companies, and of the reports published in relation to them, a committee of the Consolidated Electric Light Company are of the opinion that there are at least 100,000 such connections used, each of which is an infringement of the above patent.

The incandescence and arc lamps and dynamo manufactured by the Consolidated Electric Light Company, have peculiarly excellent features. No less than $288,000 have been expended by it in preparation, now fully matured, to manufacture, and also to enforce its rights against all who are infringing its patents. The company, as we are informed, can afford to sell both the incandescence and arc light plants at a price far below the advertised price lists of other companies.

REPORT ON THE SAWYER-MAN SYSTEM, BY MR. WM. J. GREEN, ELECTRICIAN AT THE SMITHSONIAN INSTITUTE, WASHINGTON, D. C.

The following are extracts from a report made by Mr. Wm. J. Green, electrician at the Smithsonian Institute, on the Sawyer-Man system of electric lighting. They confirm in important particulars the statements made by the Consolidated Electric Light Company.

Speaking of the Fusible Plug he says: "This fusible wire cut-off is one of the simplest, cheapest and most reliable that can be used for the purpose specified." "The Edison Electric Light Company and United States Electric Light Company use the same device described in the patent granted to Sawyer and Man."

Of the Automatic Shunt he reports: "The claims of the Consolidated Electric Light Company to this automatic shunt are fully sustained by Patent 205,303 and Reissue 10,134." "The Brush Electric Light Company use a cut-off which acts as follows: When there is an abnormal resistance in the lamp, the current is shunted to a circuit which contains an electro-magnet, and the magnet receiving more than its normal current, attracts an armature which cuts the lamp to which it is attached out of circuit, without affecting the main line. It is the same device described in the above patent, and certainly an infringement of it." Again, "The United States Electric Light Company use a cut-off acting so that when, from any cause, there is too much resistance in the lamp the current is shunted to an electro-magnet, which, attracting an armature, closes the circuit of the lamp and thereby cuts it out without interrupting the main circuit." "I have no doubt, whatever, that both of the above companies infringe this patent."

The Automatic Regulator, described in Patent No. 205,305, issued to Sawyer and Man, is an Electro Magnetic Switch or Regulator, energized by the current from the generator and acting automatically upon the occurrence of any change of electrical condition in the circuit supplied, to allow of a corresponding change in the quantity or intensity of the current generated. The eminent electrician writes: "After careful investigation I am of the opinion that the Brush Electric Light Company infringe this patent; for they use a resistance acted upon automatically by an electro-magnet energized by the main current from the generator, to vary the intensity of the magnetic field in proportion to the current required for feeding the lamp circuit."

In a passage on the process of treating carbons, Mr. Green observes: "The process of treating carbons by nearly all manufacturers of incandescence lamps, and especially by the Edison Company, is to place the glass bulb containing the electrode in connection with a vacuum pump, which exhausts the air from the bulb, and at the same time the electrode is heated to a more or less degree of incandescence by the electric current, thereby expelling the air and other gases contained in the electrode (carbon and connections) giving it greater density and homogeneity. The bulb is then sealed. This process is described in the Sawyer and Man patents to be 'in electrically heating the illuminating conductor and connections in the lamp to incandescence in vacuo, or in the presence of an inert gas, after the conductor is put in the lamp, but before the lamp is finally sealed, for the purpose of driving out all impurities and occluded gases.' This process is essential to the production of an incandescence electrode in vacuo, and the companies which use said process infringe the patents of Sawyer and Man."

This report coming from so eminent an authority is entitled to much consideration, and the ownership of these patents by this company would seem to give to it the foundation upon which the whole fabric of electric lighting is based.

Projected Deep-Sea Lighthouses.

W. C. ANDERSON's plan for founding deep-sea lighthouses received great attention at a recent meeting of the London Society of Engineers. It is to construct a hollow cylinder of riveted iron work, two hundred feet long, to consist of two sections; the upper part to be one hundred and forty feet long and fitted as an ordinary lighthouse, wholly out of the water, while the remaining portion of the tube is to be ballasted so as to sink below the water line and counteract the force of winds and waves on the exposed part. The whole apparatus is to be anchored in deep water by heavy steel cables. The inventor claims that it would be easy to tow such a structure to the spot selected for it, and then by admitting water to the lower section it would assume an upright position and ride the waves like a bottle. The idea of founding mid-ocean floating telegraph stations has long been discussed, but Mr. Anderson is the first to project a structure which would remain stationary, and if connected with the telegraph cables would not in stormy weather endanger them. Sir John Herschel ascertained that in case of a wave a quarter of a mile in breadth and forty feet in height, the displacement of the water at a depth of 1,320 feet, in its passage over it, would be less than an inch, and would be incapable of disturbing the smallest grain of land. As Atlantic waves seldom attain those dimensions, it seems to be approximately certain that the construction of a deep-sea floating station, which can be kept in place in all weathers, is not a difficulty too great for the advanced engineering of these days.

STEEL Belting is, according to report, now being made in Germany. The belts are made exclusively of steel wire, and are so constructed that they are flexible, easily fastened and may be tightened at pleasure. The pulley upon which the belting runs must be covered with leather or other suitable material for securing the necessary amount of adhesion. The belting is well adapted for heavy work, it is claimed, and is not affected by dampness or a change of temperature, as is leather.

The Chicago Exposition.

[From our own Correspondent.]

CHICAGO, June 23, 1883.

PUBLISHERS AMERICAN RAILROAD JOURNAL:

The great National Exposition of Railway Appliances is about to close, the earnest efforts made by the management to secure an extension of the original period of duration, namely, from May 24 to June 23, being futile, owing, it is said, to the rental of the Exposition Building by Theodore Thomas, and his refusal to forego his occupancy for a time. It is perhaps to be regretted that another two weeks cannot be given to the exhibitors and the public; and especially so as, owing to various causes, there was considerable delay in perfecting arrangements for the display of many exhibits; and from the further fact—strange as it may be—that in general the city Press was either so reticent or antagonistic as to Exposition interests, that public attention was not fairly drawn to the Exposition at all until, as has been the case, the positive superiority of the collective exhibits, as to number, values, and attractive arrangements became better known in consequence of visits made by the classes interested in such appliances, than by the accounts printed in the newspapers. During the latter days of the Exposition, the general public have been visitors, and the attendance and receipts correspondingly increased.

It may be justly said that the Exposition itself, as to its *utility*, and success in bringing together for inspection and test the multitudinous appliances in identity with railroad interests, has far surpassed the most sanguine hopes of its projectors, and has astonished the most practical and thoroughly posted of exhibitors and railroad men. "There are about fourteen hundred exhibitors, and almost ten times that number of exhibits, taking the various articles classified," said a leading official to your representative. (It required some ingenuity to classify some articles as strictly Railway Appliances, yet the emergency was met). In an interview with the secretary and an associate commissioner, your correspondent was told that when the scheme of the Exposition was decided upon, serious apprehension was felt by the projectors that the main Exposition Hall was far too large for the purpose, and predicted that it would be difficult to fill the building with appropriate exhibits. Yet the facts are, not only is this vast building closely occupied, but the management have been compelled to extend the limits, until acres of annex inclosure were found necessary to accommodate actual exhibitors. So much by way of general statement.

It is not surprising that among the competing interests represented, there should be cases of real or fancied grievance. Your representative was approached many times by various parties, and heard the charges of "favoritism," "inside rings," "extortion," etc., often reiterated; and he is free to say that from the complainants' stand-point, there was a show of justification. But there are, or should be, "two sides to the question." Feeling that the desire to be truly impartial is characteristic of the JOURNAL, an interview was had with the leading officials of the Exposition enterprise in order to hear their side of the story. From the facts these gentlemen presented in answer to the charges made against them and the unquestioned high character and integrity of his informants, the conclusion is forced, that the censures passed upon them are the result, in most instances, of misapprehension. While it is admitted that in the questions of juries, awards, etc., there may be ground for charges of "favoritism" and "incompetency;" in the main, even in these departments, the officials of the Exposition have endeavored to do fairly by all concerned.

To strengthen this view, it may be added that many exhibitors expressed the utmost satisfaction with the entire affair, the relations of most of whom preclude the idea that they were the subject of favoritism, etc. It is known to your correspondent that sales of machinery, royalties, patents, and various appliances of exhibitors were made at the Exposition, aggregating immense values. In many instances, also, but for this opportunity to get the critical attention of practical men, some articles of merit would have remained in obscurity; while here their worth has been appreciated, and success insured. In cases such as these, there is no complaint.

A fair criticism will justify the following views: 1. The enterprise had its inception in a two-fold plan, primarily to benefit the projectors and a certain circle in which the Pullman interests were no small factors; secondarily, to help competitive inventions. 2. The earnest, practical nature of the men whose coöperation was invoked wrought out results exceeding the narrow-minded original plan. The Exposition *as such* was a grand success. While credit is due to the originators for their inception of the idea and labor in its development, it may justly be stated that the idea developed beyond the conception of the originators. They were not fully equal to the emergency, but wisely called into operation other executive ability than their own, as witness the names of the president, Hon. Lucius Fairchild, A. G. Darwin, Esq., and the host of honorable names among the commissioners.

There will be another Railroad Exposition, and soon, perhaps, but not in Chicago. While the conviction seems justified that no considerable lapse of time can develop an exhibit much advanced above the almost perfection of applied machinery, workmanship, etc., exhibited at this, yet your correspondent dare not venture that view, as he looks upon the locomotive and cars of the days of George Stephenson and others of the pioneers, and then upon the splendid Brooks' locomotives, upon the superb day coaches exhibited by the Jackson & Sharp Co., and others, and the "sleepers" and "parlor" cars of other manufacturers. In other departments involving skill, promoting comfort, and marking advanced ideas, there were enough exhibits to impress one with the idea of the almost infinite capacity of the human intellect.

Part of the plan of your correspondent was to give in detail, interesting features of the exhibits. Two reasons, however, preclude this: The June JOURNAL was issued about date of his arrival (14th) at the Exposition. Its interest for circulation, therefore, in that direction, did not exist. And then, in the limits of one issue of the JOURNAL, a just and discriminating reference to the many articles of real value could not be made. Yet it is believed that the JOURNAL will be utilized hereafter by many whose acquaintance with it was made at the Exposition, and whose approval of its contents and spirit was pleasantly expressed. For the present, reference is omitted except as to the Electric Railway, which, in its equipment and perfect success, attracted great attention. The Exposition management being unable to induce any outside parties to incur the risk and expense incident to the construction of such an enterprise, the commissioners, to use their own words, took the matter in their own hands, and, out of the funds of the "Exposition Association, built and equipped this road, which is the first in America intended for business purposes." By the way, both the main building and annex were illuminated by electricity supplied by six different companies—the United States, the Brush, the Fuller, the Garden City, the American, and the Edison. Your correspondent can testify to the excellence of each, though he is under particular tribute to the United States Company, which furnished the Press department in that particular section in which his quarters were assigned. To say that the electric lighting system as a whole, was a success, is not enough; it was perfection. He believes that the date is near when trains in motion, depots, all public and private buildings, and highways will be lighted in a superior manner, and with economy, by this new and subtle agency; in fact, when the hand-lamp of the housewife will be provided with a miniature storage battery supplying light at the will of the user. The other forms of adaptation of the electric force in railway signals, especially as illus-

trated in the Hall system, of Meriden, Conn., may be referred to as valuable.

Attendant features of value during the Exposition, were conventions of the Association of General Superintendents; of the Master Car Builders' Association; of the Association of Railroad Telegraph Superintendents; of the Master Mechanics' Association; and the gathering of the members of the American Society of Civil Engineers. It would be a pleasure to report in full in this correspondence, the discussions of important questions among these several organizations of able and practical men, were it possible.

In concluding, it is due that earnest acknowledgments be made of the uniform courtesy with which the writer, as the representative of the AMERICAN RAILROAD JOURNAL, was at all times treated. To the Executive Management and Reception Committees of the Exposition, to the Master Car Builders' and the Master Mechanics' Associations, to the exhibitors, to various officials of railways, the writer desires to extend his acknowledgments. Being invested with the insignia-badge—"Guest: National Exposition of Railway Appliances, 1883"—was also a guarantee of recognition. A trip to Pullman, by invitation of the Master Mechanics' Association, and participation in the ceremonies of the opening of the Chicago and Atlantic Railway, the new Erie link connecting her through routes to the West, are among the pleasant incidents of this visit to the Chicago Exposition.

E.

The Railroad Engineer.

IT is very evident that the whole course of an engineer's career is not as smooth as the track he runs over. They are supposed to exercise presence of mind, no matter what stares them in the face. The engineers on the Pennsylvania railroad receive $3.80 a day, or $115 a month. For instance, a round trip from the Broad street station to Jersey City and back, 182 miles, is considered a day's work. Every third day they have off. Some engineers get through their day's work in less time than others. For example, engineer Larrison leaves Broad street with the half-past seven o'clock express in the morning and gets back to Broad street at twenty minutes past two in the afternoon. He takes his engine out to Powelton avenue to the round-house, and then his day's work is done, and he is free until half-past seven the next morning. Every steam horse has a stall in the big round stable, and its "hostlers," as the men are called who take care of and clean the engines. Engineer Larrison gets off his engine much the same as a jockey gets off his sulky when the race is over. The hostlers take charge of the engine, which has become dirty and tired-looking from dashing over 182 miles of road-bed.

When you see an engineer who is running a passenger train, you can make up your mind that he has worked a long time on an engine before he reaches that important post. First, there are four or five years to be served as a fireman, and then several years on a freight train.

The engineers on the Pennsylvania road are carefully selected by the road foreman of engines, and no man known to drink liquor would be allowed to run an engine an hour. Not only is their life while on duty carefully scrutinized, but their movements while off duty are generally known by the officers. "A man must have the qualifications of a clear head and a steady hand," said an official to the reporter.

If the newspaper express is detained a single minute on the road, the conductor has to make out a detention report, stating where the detention occurred and the cause of it. As soon as the train arrives at Broad street, the report is telegraphed to Trainmaster Adams, at Jersey City, so that immediately after the train's arrival here, he knows exactly the whole history of its run. The train leaves Jersey City at 4:40 A. M., and the great disadvantage in making a fast run with it is that the engineer has not daylight to do it in, except in midsummer, and then it is often very foggy. Fog is an engineer's worst enemy. They dare not run so fast as in clear weather, and have to slow up frequently to see if the signals are all right. Rain makes the tracks more slippery than snow, and necessitates slowing up sooner on approaching a station, which means lost time. Snow always gives an engineer the blues, and next to fog is dreaded worse than anything else. Many engineers are particularly cheerful when they have a bright moon, and claim they can make better running time than without it, while many feel happy and contented with the company of a clear sky full of stars.

Some engineers handle a train more gracefully than others. Some stop a train gradually by applying the air and then allowing it to exhaust, repeating the manipulation two or three times, which stops the train by degrees and prevents the jerking of the cars, and shaking the passengers up, while other engineers, who have not the knack, stop the train frequently with one application of the air-brake.

Charles Dickens told a friend on alighting from a train during a visit to this country, that his first thought on stepping upon the platform was, "Thank God and the engineer." A close observer will notice that travelers seldom look at the engineer as they pass down the platform from the train when they have reached their journey's end.—*Ex.*

Coney Island.

BRIGHTON PIER THEATRE.

A CURIOSITY in the attractions of this celebrated watering place, is that the theatre with the above caption is built out into the sea, nearly a quarter of a mile, at the extreme end of the new iron pier. The enterprising manager is Mr. James Donaldson, Jr., of the London Theatre on the Bowery. This is an original conception of his, and he says that the old or constant visitor to the island needs just such a place, where he may be fanned by the ocean breezes and at the same time enjoy a first-class entertainment. We have found by experience that it is so.

MESSRS. PALLISER, PALLISER & Co., of Bridgeport, Ct., the well-known Architects and Publishers of standard works on architecture, have lately issued a sheet containing plans and specifications of a very tasteful modern eight-room cottage with tower, and also with the necessary modifications for building it without the tower, and with but six rooms if desired. In its most costly form, the outlay is estimated at $3,000; without the tower it has been built for $2,500; and if only six rooms are included, the cost may be reduced to $1,700 or $2,000. Details are given of mantels, stairs, doors and casings, cornices, etc. The publishers have found it the most popular plan they have ever issued, and state that it has been adopted in more than five hundred instances within their knowledge. The same firm issue Specifications in blank, adapted for frame or brick buildings of any cost; also forms of building contract, and several books on modern, inexpensive, artistic cottage plans which are of great practical value and convenience to everyone interested.

A PINE floor laid in a gold worker's shop in ten years becomes worth $150 per foot. A Syracuse jeweler once bought for less than $50 some sweepings that gave $208 worth of gold. A tub in his cellar, into which is blown the dust from a polishing lathe, accumulates $50 a year. A workman in his shop carried off on the tip of his moistened finger $30 of filings in a few weeks. Workmen sometimes oil their hair and then run their fingers through it, leaving a deposit of gold particles, which they afterward wash out.

"BRING me no more reports" unless written by one of those marvels of ease and comfort, one of Esterbrook's Pens.

Lost Rivers in the West.

About nine miles above the town, on the line of the old military road, the little Santa Cruz River disappears forever, working one of those strange phenomena so often found in this country—lost rivers. Old residents say that you can hear its rumbling under ground. It could, no doubt, be recovered. This furnishes a plain illustration of the truth of the theory so often broached of the existence all over the inter-mountain country, of subterranean streams, from which it is possible to secure what in this arid belt may be regarded as an ample supply of water. A friend predicts that it will not be ten years before the chief assults of the Eastern press on the corrupt and lavish expenditure for internal improvements will no longer be directed toward rivers and harbors, but that it will hinge upon a more or less comprehensive scheme for the preservation of water, the means of its distribution, the construction of reservoirs, and the recovery of lost rivers, with expensive plans of forestry; all of which my friend declares Congress will be considering, and the country east of the Mississippi opposing. The people here aver that one-half of this vast mountain table-land, which within the boundary of the United States may be roughly estimated at one thousand miles north and south and the same distance east and west, can, by the careful reclamation and preservation of the water to be found within it, be made entirely useful for agricultural and pastoral purposes.—*Arizona Letter to Ohio State Journal.*

Railway Travelers' Rights.

The courts have recently given the benefits of justice, in two notable cases, to railway passengers. These persons were traveling upon tickets which had been bought in the usual way, and they were violently ejected from railway trains by the conductors of one of the most powerful of our railway companies. The verdicts indicate once more that the traveler whose rights have been ignored upon railways, can look with confidence to the courts for fair treatment, and may reasonably expect to recover a round sum of money from the offending company.

The case of W. J. Connell, of Omaha, against the Pennsylvania Railroad Company has been tried twice, and at the end of each trial the plaintiff has recovered $15,000, which was all that he demanded. Mr. Connell came to Washington in 1880. Having made an argument before the Supreme Court he undertook to come to this city. He had come from the West upon an unlimited or stop-over ticket, which gave him transportation over the Baltimore and Ohio Road to Washington, and over the Pennsylvania Railroad from Washington to this city. Soon after leaving Philadelphia a conductor refused to honor his ticket, upon the ground that a conflict between the Baltimore and Ohio Company and the Pennsylvania Company, had led the last named company to discontinue the sale of tickets allowing a passenger to travel part of his way on one road and the remainder of his way on the other. Mr. Connell refused to pay any additional money, and was thrown from the train by several employés of the road. It appeared during the trials that the pooling arrangement had not been broken until after Mr. Connell had bought his ticket, and that the Pennsylvania Company had received its *pro rata* for the identical ticket which the conductor refused. The defense was so weak, that the only question for the jury to consider was whether the passenger's rights had been affected because he stopped over at Washington, although his ticket allowed him to do so. The jury gave the plaintiff $15,000, as has already been stated.

The other case was that of Frank Spicker, a salesman, who was traveling in 1881 between Williamsport and Philadelphia, upon an excursion ticket, which one conductor accepted and another refused. Spicker was pushed from the train, and left in the open country, while it was raining heavily. The fact that the ticket had been paid for was not denied, but it was shown that the company had, by advertising, tried to call in tickets of that class. The jury gave the plaintiff $5,000.

It appears from the published reports ,that the company's defense in each of these cases hardly deserved consideration. The plaintiffs had both the law and the facts on their side. Yet they have been compelled to wait two or three years for justice. Many persons who are wronged by railway companies are either unwilling or unable to begin a long and costly contest in the courts. The courts, however, have almost uniformly protected and vindicated those who have chosen to appeal to them, and if every wronged and abused railway traveler could be induced to place his case before a jury, the companies would become less tyrannical, and travelers on every railway in the country would have cause for thanksgiving.—*New York Times.*

A Mile a Minute.

RAILROAD TRAINS WHICH HAVE BECOME MARVELS OF SPEED.

By far the most important element in the comfort of the traveler is the rate of continuous speed attained by a railroad train. The high rate of the accommodation train does not offset the worry and fret of the frequent stops, and a long run without getting over much ground is an annoyance almost as grievous as being side-tracked in the broiling sun on a hot summer's day to wait for a belated freight train, or an aggravating excursion which blocks the way. England, as a recent essay by Mr. A. L. Roch shows, surpasses us both in the number and speed of its fast trains, but Germany, though only a little behind, can hardly claim any superiority over this country in the matter of fast trains. The fastest train in the world for some years, and it probably is so still, though its time has been somewhat reduced, is "The Flying Dutchman," which used to cover the distance between London and Bristol, 118¼ miles, in two hours. Germany follows with a train from Berlin to Hanover, which runs 152½ miles in three hours and forty-eight minutes, which is at the rate of 51.7 miles an hour.

The palm for speed in this country is closely contested by the two companies performing the service between Philadelphia and New York. During the Centennial, two hours and a half was the shortest time known between New York and Philadelphia. Since then, two hour trains have become frequent upon the time-table, and the competition as to which road should make that time the oftener has been very sharp. According to schedule, the train leaving Jersey City by the Pennsylvania at 4.08 P. M. runs at the rate of 47.8 miles an hour, while that on the Bound Brook route runs at the rate of 47.7, but has a mile less distance to run and less populous towns to traverse. It is difficult to say which best deserves the palm for fast time. For long distance, the New York and Chicago limited is without a rival in the world, making, as it does, 913 miles in twenty-five hours. The fastest long-distance train, and the fastest train for any distance of more than fifty miles, is the express on the Orleans line between Paris and Bordeaux, which runs 359 miles in nine hours and ten minutes, or thirty-nine miles an hour.

The elements entering into the shortening of time between two distances are many, and they increase rapidly, even out of proportion to the gain in the speed. Exceptional runs have been made on nearly every railway in the country, and there are few first-class roads over which a passenger coach has not been hauled at the rate of a mile a minute. Mr. Vanderbilt has often traveled one hundred miles in one hundred minutes, and an engine has drawn a single coach between Philadelphia and New York in ninety-five minutes. The 4.08 train previously spoken of always runs some parts of the distance at a rate of more than a mile a minute, and its easiest run is from New Brunswick to Trenton—twenty-five miles in twenty-six minutes and a half. This speed is only possible, however, with a heavy engine, heavy

steel rails, a solid road-bed, a comparatively light train, slight grades, and easy curves. All of these elements have their force, and how great force will be better understood when it is known that the improvements now making on the Pennsylvania will enable the company to shorten the time between New York and Philadelphia ten to fifteen minutes, without any faster running than is done on many long stretches now. The straightening of the track and the moving of the bridge across the Passaic, and the finishing of the last cut through Bergen hill will save four minutes in the eight miles between Newark and New York, and the reducing of the grade and sinking of tracks through the northern part of Philadelphia will help almost as much more. When the work is completed, "to New York in one hundred minutes" will be a reality rather than a possibility.—*Philadelphia Press.*

Free Trade With Canada.

In the July number of *The Century Magazine*, Watson Griffin reminds his readers that Canada is now the name for the whole of British North America—a territory almost as large as the whole of Europe, rich in minerals, and possessing the finest fisheries and the largest area of land adapted to the production of first-class wheat in the world. It contains a vast territory which will yield from twenty-eight to forty bushels of wheat per acre. United States Consul Taylor says that three-fourths of the wheat-producing area of North America lies within the dominion of Canada. The Canadian Pacific Railway is being pushed through to British Columbia with an energy almost unparalleled in railway construction; and during the last three years, Manitoba has been filling up with settlers almost as rapidly as the Western States did in their most progressive days. Trade in the east of the dominion, due to this expansion of Western resources, is attaining large proportions. The time will come, Mr. Griffin thinks, when the stream of emigrants from the Eastern States will be diverted to that section of the great Northwest lying within British territory, and then, unless free trade prevails, the United States will experience what Canada did owing to the rapid development of the Western States—a loss of population without any compensating advantages in the way of trade, while eastern Canada will be built up by the trade of the Northwest. With free trade, on the contrary, the cities of St. Paul, Minneapolis and Chicago would be more convenient for the trade of western Canada than cities in the east of the dominion, and the cities of the Eastern States could compete on equal terms with those of eastern Canada. For these reasons, presented at greater length in his article, Mr. Griffin advocates free trade with Canada.

Railway Employes in Germany.

Another instance of the severity with which negligence of railroad employés is punished in Germany is given by a trial, last March, of three stationmen at Furth. One morning, last September, a live-stock train was run into a blind siding because of a misplaced switch, and many cars were thrown from the track, killing three employés and injuring ten more, and destroying property to the value of $20,000. The persons tried were a day laborer at the station, and two candidates for regular employment in the railroad service. The laborer had turned the switch to set off a car upon the siding, and, having his attention called away for a minute, forgot to close the switch, but started to carry the mail bags to the village, about ten minutes distant. It was argued for him that he was overworked. The two candidates were required, by the regulation, to inspect the switches and see that they were in order before the arrival of every train. The laborer had been in the service of the road twelve years, and was acting as post-office messenger and switchman, in addition to performing his duties as laborer, endeavoring to gain adequate support for his family of four. As laborer he received thirty-three cents a day, and in the other capacities earned $7.30 a month. There was testimony that he got but three or four hours sleep a day.

The prosecuting attorney asked that the man be sentenced to prison for a year, and the others for nine months each, and that all be disqualified from railroad service thereafter. The court sentenced the laborer and one of the candidates to six months, and the other to five months' imprisonment, and to pay one-third of the cost each.—*Ex.*

SPIKES.

A train on the New York Central and Hudson River Railroad stopped below Spuyten Duyvil a few days ago on account of a hot journal, which was blazing up and threatened to set fire to the car. The moment the train stopped the rear brakeman ran back with a red flag to stop any coming train. The conductor went to the last car to see that the brakeman was doing his duty, and then set at work to cool the journal. While he was occupied in this task a man of dignified appearance approached. "What did that man go back with that red thing for?" he asked. The conductor paid no attention to him, and he repeated the question. Finally he remarked to the unmindful conductor: "Do you know who I am?" The conductor replied that he did not, and, what was more, did not care a continental. "I am a Railroad Commissioner, sir." The conductor, nothing daunted, retorted that the Commissioner ought to know without asking what a red flag meant.

Three Chinamen, seated in a car on the Columbia avenue cable road yesterday, were bound to East Park. They waited in silence for the team to be led out. Suddenly the car started and moved away rapidly. The Mongolians sprang to their feet. "No holsee in flonts!" screamed the first, staring wildly ahead. "No holsee backe!" cried another rushing toward the rear platform. "No sabbee," said the third, seating himself. "Go like hellee, allee same."

A Young man has just written a poem on "A Fly's Back!" This is the greatest achievement of the age, because it is not more than once in six centuries that a fly is found which will keep quiet long enough to allow a poem being written on its back.—*Ex.*

Mrs. Stowe's little grandson, at the age of five, swinging on a neighbor's gate, was reproved by his mother, who told him Mr. Smith would not like it. "I don't care for Mr. Smith," said the urchin, "nor for his ox, nor his ass, nor anything that is his."

A young lover in Iowa paid $40 for a locomotive to run him thirty-five miles to see his girl, and when he got there the family bull-dog ran him two miles and didn't charge him a cent. Corporations have no souls.

"That butter is all right," said a boarding-house keeper, "it is firkin butter, and tastes a little of the wood, that's all." "If that's the case," replied a boarder who is a contractor, "I should like to get some of that wood to make railroad bridges of."

A party of young men dined sumptuously at a restaurant, and each one insisted on paying the bill. To decide the matter it was proposed to blindfold the waiter, and the first one caught should pay the bill. He hasn't caught any of them yet.

"Is this my train?" said a man at Newmarket. "I don't know, but I fancy not," said the station-master, doubtfully. "I see it's got the name of the Great Eastern Company on the side, and I expect it belongs to them. Have you lost a train anywhere?"

The longest span of wire in the world is said to be used for a telegraph in India, over the River Ristan—6,000 feet long. Sixty-six thousand of Esterbrook's Ladies' Pens, No. 1,170, joined together lengthwise, would bridge the chasm.

Comments on the Railway Exposition at Chicago.

THE EXPOSITION.

THE National Exposition of Railway Appliances closed according to announcement Saturday night, June 23. As an exhibition it was a great and undoubted success. Our readers have been fully informed as to its salient points and much of the detail. Owing to the vastness of the affair and the limited time, it was utterly impossible to compass all its features of interest and importance during its continuance. Our columns will therefore contain extended references to it for some time to come.

It is greatly to be regretted that anything was attempted beyond an exhibit pure and simple. The competitive system has been a prolific cause of trouble and complaint, and has rendered it unsatisfactory to a large proportion of the exhibitors as well as to the management. Most of the complaint has been of a petty character, and while annoying, is entirely unworthy of attention. The awards of medals were not made until during the current week, while it was expected that they would be made before the close of the exhibition. The cause of this was the unwise plan of appointing juries. The appointments were, as is well known, made from nomination made by the exhibitors. Exhibitors were then allowed to protest against individual jurors, the idea of the commissioners being to exercise the utmost fairness. Theoretically this was very fine, but practically it worked infinite trouble. The jury list as published was, on the whole, very good. But it at once appeared that there was a great repugnance among many of the most capable men to serving in such capacity. Some of them absolutely refused, and their places had to be filled by others. Then the protests began to come in—some of them with a show of reason, but many with none whatever. Many of the juries had to be re-formed four or five times, until it became necessary in some cases for the commissioners to take what they could get. While this tedious and annoying work was occupying the commission, time slipped rapidly away, and with it went some of the selected jurors. The hours of the Exposition were numbered, and extension was impossible. The necessary result of this was some hasty work on the part of juries, and unavoidable delay in announcing their verdicts. A large amount of disappointment is inevitable in connection with any system of making awards. Unfortunately it was greatly aggravated in this case by a plan of operations which was really designed to obviate all just cause of complaint.

One prolific source of complaint was the failure to make any practical or scientific tests. Considerable prominence was given to the subject of tests in both the printed matter and the letters sent to parties desiring space. It was announced that adequate plans and preparations had been made for such tests, and that all could have tests who desired them. All applicants were, however, supplied with copies of the rules and regulations. These specified (Rule VI, Section 1) that "awards will be based upon examinations and tests made in the most thorough possible manner." But they also specified (Rule VI, Section 7) that "expert tests will be made where a majority of the exhibitors in a class, exhibiting articles intended for a like purpose, make the request, such request to be filed with the secretary on or before April 1. The expense of expert tests to be borne by the competitors requesting them." We cannot learn that any exhibitor protested against this rule, or that any class of exhibitors made request under it for tests. Many came fully expecting such tests, they say, and were disappointed in not having them; but it does not appear that they took the means pointed out in the rules.

That the juries did not make "examinations and tests in the most thorough manner possible" is beyond dispute. This was, as we have seen, largely due to obstacles met by the commissioners in securing juries and the extremely limited time left for the juries to act.

Looking back over the affair from its first conception to its close, several things suggest themselves to honest criticism—(carping critics can always find abundant material in the best managed affairs). The points we allude to (besides the unfortunate award system) are these: Business prudence dictated that the organization should be incorporated, and the stock scattered as widely as possible among exhibitors. This would have given a widely distributed financial responsibility and a corresponding interest in aiding and upholding the management. It would also have been a relief to the commissioners, who, as it is, are obliged to shoulder a load which does not properly belong to them. Another point which is justly made is, that there has been an abundant lack of system and not sufficient division of responsibility. A man may be very able in his specialty and yet not able in everything else, and no matter what his ability, there are fixed limits to capacity and endurance. It was possible at an early day to have called in sufficient ability and experience, and to have effected an efficient division of labor. As it was not done, the results became apparent as soon as the Exposition opened. Then several of the commissioners threw themselves nobly into the breach, and have esteemed no sacrifice of time, money and health too great. How well they have worked, and how much credit they are entitled to for it, no one can properly estimate who has not seen them day by day at their tasks. They have no recompense except such credit and reputation as the public sees fit to award them; and to meanly attempt to detract from this is simply contemptible.

The Exposition goes into history as a most important industrial event. Time will clear up the clouds cast about it by petty malignity, and its true worth will be appreciated by all, as it now is by those far-seeing ones whose sight is not easily dimmed by inevitable smoke of even industrial battles.—*Railway Review.*

THE RAILWAY EXPOSITION.

The Railway Exposition is ended and the vast building and the adjacent grounds, which for a month have been filled with the greatest display of machinery and appliances ever before brought together, are already nearly empty and forsaken. The work of assembling this great collection, much of it consisting of heavy and complicated machinery, required so much time as to considerably delay the complete opening of the exhibition, and the work of removal was so great that a full week or more will be required to accomplish it. General regret was expressed among exhibitors and visitors that this magnificent display, gathered and put in position by the expenditure of so much money, labor and ingenuity, had to be torn up so soon after it had got into smooth working order, but other engagements for the building made it impossible to secure an extension of time.

It is too soon for the public to realize the vast benefits which will accrue from this great exhibition. One thing is admitted, even by the always fault-finding and censorious—that the exposition was an unparalleled success in respect to the character and number of exhibits. That it was conducted with scrupulous integrity and a desire to do justice to all interests concerned, and that the commissioners were animated by a high degree of public spirit, sacrificing thereto their own business and comfort, assuming without any recompense great pecuniary responsibilities and unremitting and harassing labors by night and day, a glance at their names and at the record of the exposition itself plainly testifies. When it is remembered that there was no permanent organization back of this enterprise, and that the handful of gentlemen who took the active management, abandoning their own business meantime, found themselves involved in a work of enormous magnitude and complication which they knew would receive little appreciation, it seems surprising that the exposition was so well managed and that so little cause for com-

plaint was given. Of course, where a great number of men are eargerly competing for prizes it is impossible that all should be satisfied with the result, but while there was, as is the case with all public undertakings, some fault-finding and ill-natured criticism, the general verdict of the public press and of the exhibitors and visitors has been that of extreme satisfaction. This feeling has been expressed in a letter prepared and signed by a very large number of the most prominent exhibitors without the knowledge of any gentlemen connected with the management of the exposition, expressing high appreciation of "the uniform courtesy and fairness which has attended the management of the National Exposition of Railway Appliances," and of the benefit which it has been to "scientific men and skilled artisans everywhere."

It is too early yet to announce the exact pecuniary results of the exposition, but it is probable that the receipts from exhibitors and visitors have not been sufficient to meet the heavy expenses, and that the managers will have to make good a considerable deficit.

We have obtained from the treasurer, J. McGregor Adams, Esq., the following statement which, it is believed, will not be materially changed by the final figures :—

RECEIPTS.

Space fees	$25,560 02
Entrance fees	5,115 00
Premium fees	6,405 00
Exhibitors' tickets	6,779 00
Admissions	61,534 45
Miscellaneous	1,792 43
Elevator	613 20
Electric railway	2,649 60
Railroad coupons received	3,180 00
Estimated value of material on hand	10,030 00
Total	$123,628 70

DISBURSEMENTS.

Expense account	$10,954 38
Pay rolls	13,824 94
Printing, stationery and advertising	9,350 91
Annex buildings	28,810 17
Annex tracks	5,171 85
Alterations and improvements in main building	17,121 10
Electric railway	12,187 55
Machinery and steam account	7,306 40
Furniture and fixtures	622 57
Foreign exhibits	2,283 30
Estimated cost of medals	10,000 00
Oustanding liabilities	16,000 00
Total	$133,633 17
Possible deficit	$10,000 00

Although a considerable portion of the cost of the Exposition fell upon the exhibitors in the form of space fees, etc., as was proper, seeing that they were the parties to be directly benefited, the general testimony of these exhibitors is that their outlays have been reimbursed many fold by the sales made and by the publicity which has been given their manufactures and devices.

Perhaps the most difficult feature of the exhibition plan was the award of prizes. The services of the juries were voluntary, and as they involved no little labor and much unpleasant criticism, it was with considerable difficulty that competent persons were found to serve. The jurors, however, worked faithfully and impartially and have only just completed their verdict, which is shown in the list of awards published in this issue. While it cannot be expected that the decisions will be satisfactory to all, the fairness and good intentions of those making them cannot be questioned.

It seems proper to add that no article which has appeared in *The Railway Age* since the commencement of the Exposition has been written, suggested or even seen before publication by any one connected with the exposition management.—*The Railway Age, June* 28.

PORTLAND, Oregon, is to have this year a million dollar bridge and railroad workshops costing five millions.

[Advertisement.]

CHICAGO PAPERS ON

Valentine & Company's

EXHIBIT OF VARNISHES

AT THE

RAILWAY EXPOSITION.

Paint, Oil and Drug Review, June, 1883.

Valentine & Co., manufacturers of railway and carriages varnishes, have a handsome booth occupying quite a space, which is made of solid cherry and highly polished. It is modeled with most excellent taste and arranged with entire harmony as to colors, and is a feature of large attraction to visitors. It is situated near the main entrance to the Exposition Building, facing on three avenues. The well-known brand of varnishes made by this company are distributed about the booth in a modest manner, in the regular packages which have been nickel-plated before being filled. They have also a number of fine cut-glass vessels, which clearly show the body and color of the various varnishes. The booth is open on the sides fronting on the three avenues. It is surmounted with painted banners, with the names, "New York, Chicago, Boston, Paris," which our readers will recognize as the houses of this company. Along the top of the four sides are very handsome shields which are polished and varnished with their goods, upon which is painted their familiar trade-mark. The merit of their work is seen on a large number of panels which have been painted with railway colors before being varnished. A most tasty and finely fitted office, which can be closed as occasion warrants, occupies part of the booth. The lights are made of colored glass artistically arranged, while the carpetings and upholsterings are in perfect accordance with the surroundings. The private office is furnished with desk and writing materials which many of the visitors find very convenient. There is also placed within the booth, after the model of one of their varnish cans, an ice-water cooler. The exhibit certainly stands eminently out as one of the best, if not the most tasteful display to be seen in the Exposition Building. It is illuminated by the Brush Electric Light, and presents a very fine appearance in the evening.

Chicago Times, June 21, 1883.

An unusually attractive exhibit is that of Valentine & Co., manufacturers of railway and carriage varnishes. The framework of the booth itself, which is located near the main entrance, is of solid cherry, highly finished. The electric light combined with the brilliant varnish and handsome fittings, make a most beautiful and striking display. In the cities of New York, Chicago, Boston and Paris this company have branch houses, and an extensive business with foreign representatives at London, Vienna, Barcelona, Amsterdam, Moscow, Melbourne, Sidney, Adelaide, and Wellington, New Zealand.

A practical illustration of the superiority of the varnishes manufactured by Valentine & Company, is presented in a large variety of finished panels in the standard colors of the Pullman, Pennsylvania, and Chicago and Northwestern railway companies. The magnificent car built by John Stephenson, of New York, for the North Chicago Railway Company, and on exhibition in the west annex, affords another practical illustration of the beauty of these varnishes. This car, which is greatly admired, has been on exhibition through all the rain and dampness attending the Exposition, and is yet as bright as a new dollar. Valentine & Company have received medals wherever their varnishes have been exhibited. If the award is made for superiority in quality of goods, this company will, it appears, have a clear field from the outset, as they admit of no rivals in the make of railway varnishes.

Daily Telegram, June 16, 1883.

FINE POLISH AND DURABILITY.

Valentine's railway varnishes now stand preëminent in all countries where civilization has created a demand for first-class transparent polish. New York, Chicago, Boston and Paris are the centers where the company have warehouses and offices from which the world can be supplied with the productions which this justly celebrated firm manufacture. One of the leading specialties, and for which we understand this company admits no rivalry, is the tone of railway coach finishing varnishes. The rewards of merit held by the Valentine Company for goods in their line include the following, to wit: International Exhibition, Philadelphia, bronze medal and diploma, 1876; Exposition Universelle, Paris, France, silver medal and first degree of merit, 1881-1882; American Institute, New York, silver medal and diploma, 1859; Melbourne International Exposition, Melbourne, Australia, silver medal and first degree of merit, 1880-1881; Mechanics' and Agricultural Fair Association, Louisiana, diploma, 1873; Mass. Char. Mechanics Association, Boston, silver medal and diploma, 1860; Maryland Institute for the Protection of the Mechanic Arts, silver medal, 1877; Mechanics' Institute, silver medal, 1877; Exposition Peru, medal, 1870. The peculiar merit awarded by all to Valentine's varnishes consists in the high degree of polish attainable, and their great durability.

Railway Age, June 7, 1883.

The exhibit of Valentine & Co., avenues A and B, is displayed very tastefully in a splendid structure of stained cherry and brass surmounted by banners, on which are inscribed the names New York, Boston, Chicago and Paris, cities in which they have establishments.

June 21, 1883.

Messrs. Valentine & Co., manufacturers of fine coach and car varnishes, occupy a pavilion south of the main entrance. The display of varnishes in tubes and cans is worthy of more than a passing notice. The railway coach finishing is very pale, dries in about eight hours and hardens ready for use in three to five days. Inside coach finishing varnish, though not so durable as the above, is similar in color, luster and working. The railway coach rubbing varnish dries in six to eight hours and hardens in four days. Inside coach rubbing dries quicker and harder than the above. Valentine's locomotive finishing is well adapted to its purpose. The smoke-stack varnish is an elastic black that dries quickly. Railway Japan gold size is a superior oil-drier of light color, nearly double the strength of ordinary Japan. In 1876, Valentine & Co. were awarded bronze medal and diploma at Centennial International Exhibition, Philadelphia; 1877, silver medal, Mechanics' Institution, San Francisco; 1878, silver medal, Exposition Universelle, Paris, France.

Railway Purchasing Agent, June, 1883.

Valentine & Co., of New York, Chicago, Boston and Paris, occupy at the Exposition a pavilion of great beauty and tasty design, erected on the east side of the building, a short distance from the main entrance. In this is a private office and some comfortable seats, while the walls are adorned with many beautifully varnished designs, giving practical illustration of the qualities of their varnishes. Transparencies and handsome fittings make this one of the most attractive of resorts, which will, no doubt, be appreciated by railroad men who are looking for first-class goods in this line."

Chicago Journal of Commerce, June 20, 1883.

Valentine & Co., manufacturers of fine coach and car varnishes, occupy a pavilion south of the main entrance which is conspicuous from the extreme good taste displayed in its construction and appliances. The wood work is of stained cherry, the panels in ground glass, with richly stained glass at intervals, giving a pleasing effect to the whole. On each of the corners surmounting the enclosure are four pennons in light blue and gold, bearing the names of the parent house and branches, New York, Chicago, Boston and Paris. The display of varnish in tubes and cans is worthy of more than a passing notice. The railway coach finishing varnish is very pale, dries out of the way of dust in about eight hours, and hardens sufficiently free from touch to be ready for use in three to five days. In working, fullness, luster and durability, it is unsurpassed. Inside coach finishing, though not so durable as the above, is similar in luster, color and working. The railway coach rubbing varnish dries in six to eight hours and hardens in four days so as to rub without sweating. Inside coach rubbing varnish dries quicker and harder than the above, and in good weather will harden in two days; it is sufficiently pale for any light work. Valentine locomotive finishing varnish is well adapted for its purpose; it dries over night out of the way of dust, and hardens ready for use in two or three days. The smoke-stack varnish is an elastic black that dries quickly and has a fine luster and durability. Railway Japan Gold Size is a superior oil-drier of light color, nearly double the strength of the ordinary Japan, and once known is indispensable to coach and car painters for binding and hardening through. It will be interesting to name say three of the exhibitions out of a dozen or so where Valentine & Co. secured medals and diplomas. In 1876 they were awarded the bronze medal and diploma at the Centennial International Exhibition, Philadelphia; 1877, silver medal, Mechanics' Institute, San Francisco; 1878, silver medal, Exposition Universelle, Paris, France.

Evening Telegram, June 14, 1883.

One of the neatest and most unique booths in the Exposition is that of Valentine & Co., varnishes, located south of the main entrance, avenues A and B. The architectural beauty of the design, the material of which it is built, and the elegant finish upon the natural cherry wood, strikes the visitor forcibly, thus attracting the attention to the samples of varnish upon exhibition. Valentine's Railway and Coach Varnishes deservedly stand in the front rank where their merits are known. It is with the view of calling attention of visitors to the reputation of this firm as manufacturers of the higher qualities of varnishes that the writer was induced to stop here and study the subject of varnish. He is convinced that the samples of varnish exhibited cannot be surpassed by any manufacturer in the land. It is this very superior quality that imparts the transparent polish to the railway car, interior and exterior, placing the name of Valentine far above the average manufacturer.

The Lake Shore and Michigan Southern Railway Co.

Treasurer's Office, Grand Central Depot,
NEW-YORK, June 22, 1883.

The Board of Directors of this Company have this day declared a quarterly dividend of TWO PER CENT. upon its capital stock, payable on WEDNESDAY, the FIRST day of AUGUST next, at this office.

The transfer books will be closed at 3 o'clock P. M. on FRIDAY, THE 29TH INSTANT, and will be reopened on the morning of Monday, the 6th day of August next.

F. W. VANDERBILT, Acting Treasurer.

Office of the Central Pacific Railroad Company,

No. 23 BROAD ST., NEW-YORK, June 25, 1883.

The coupons of the first mortgage bonds of the Central Pacific Railroad Company, the Western Pacific Railroad Company and the California and Oregon Railroad Company, due July 1, 1883, will be paid at the office of Fisk & Hatch, No. 5 Nassau St.

Holders presenting ten or more coupons will leave them for examination, in which case a receipt will be given and payment made on the following day.

E. H. MILLER, JR., Secretary.

Prominent Locomotive and Car Builders.

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Barney & Smith Manufacturing Co., Dayton, Ohio.
Beaver Falls Car Co., Beaver Falls, Pa
Osgood Bradley, Worcester, Mass.
J. G. Brill & Co., Philadelphia, Pa.
Brooks Locomotive Works, Dunkirk, N. Y.
Brownell & Wight Car Co., St. Louis, Mo.
M. M. Buck & Co., St. Louis, Mo.
Erie Car Works, Erie, Pa.
Gilbert & Bush Co., Troy, N. Y.
Harlan & Hollingsworth Co., Wilmington, Del.
Haskell & Barker Car Co., Michigan City, Mich.
Hazelton Car Works, Hazelton, Pa.
Indianapolis Car and Manufacturing Co., Indianapolis, Ind.
Jackson & Sharp Company, Wilmington, Del.
Jones Car Manufacturing Co., Schenectady, N. Y.
Keith Manufacturing Co., West Sandwich, Mass.
Kingston Car Works Co., Kingston, Canada.
Laconia Car Co., Laconia, N. H.
Lima Car Co., Lima, Ohio.
Wm. Mason & Co., Taunton, Mass.
Mansfield Machine Works, Mansfield, Ohio.
Muskegon Car and Engine Works, Muskegon, Mich.
Ohio Falls Car Co., Jeffersonville, Ind.
Pardee Car Works, Watsontown, Penn.
Portland Locomotive Works, Portland, Maine.
Pullman Car Co., Pullman, Ill.
Rogers Locomotive and Machine Works, Paterson, N. J.
Schenectady Locomotive Works, Schenectady, N. Y,
The John Stephenson Co. (Lim.) New York City.
Taunton Locomotive Works, Taunton, Mass.

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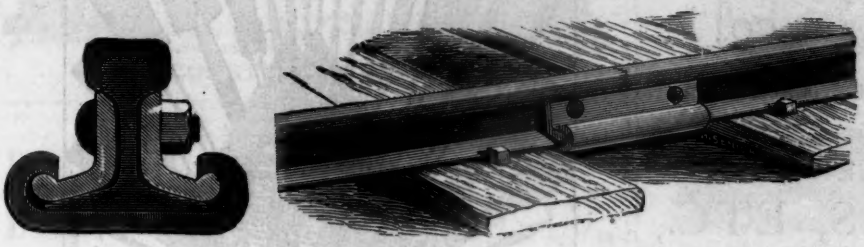

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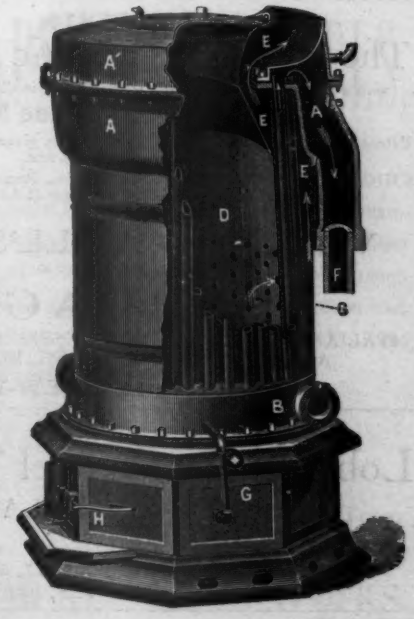

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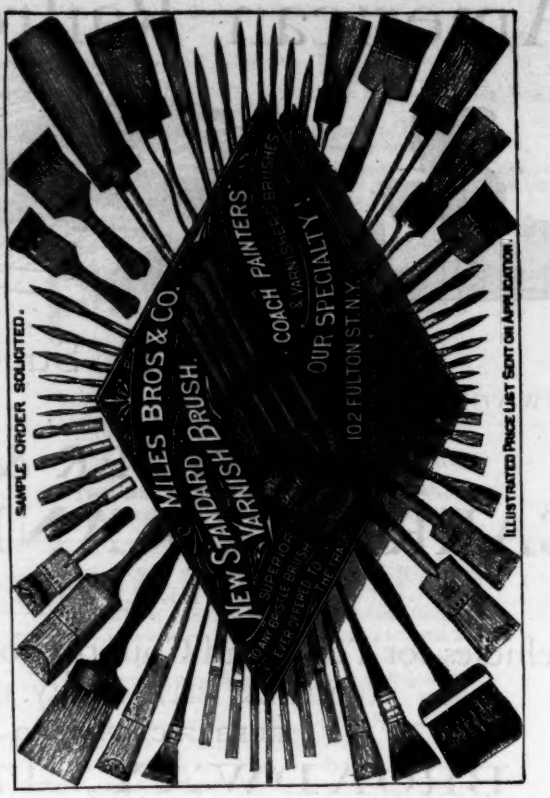

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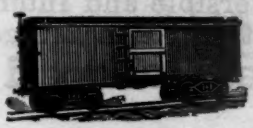

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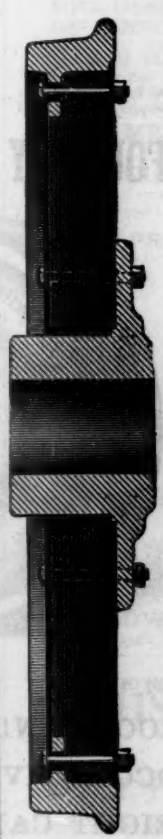

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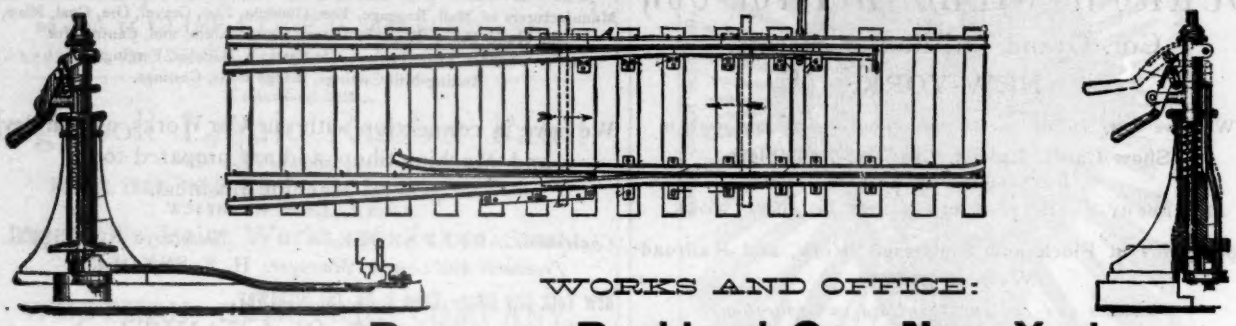

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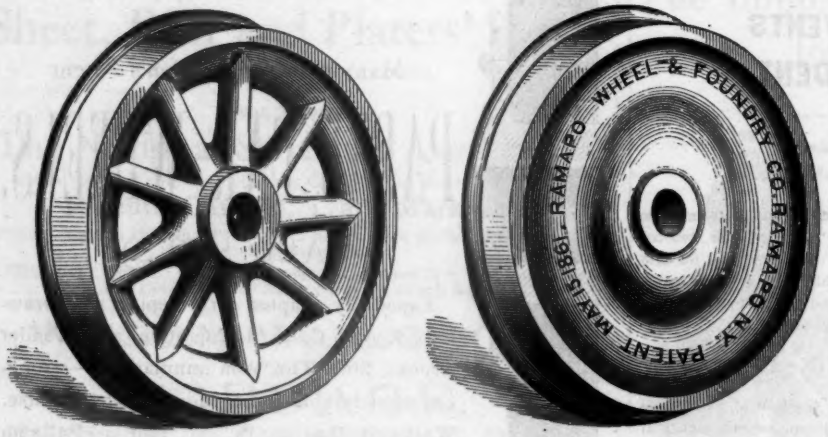

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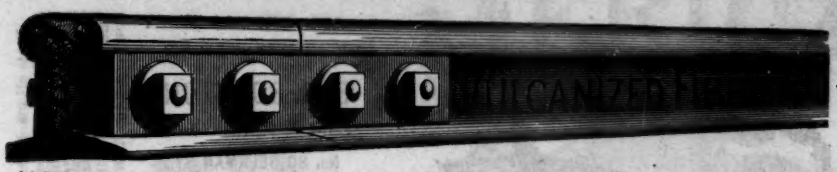

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THE E. M. BOYNTON FILE AND SAW COMPANY,

MANUFACTURERS OF ALL KINDS OF

Saws, Saw-Sets Patent Cross-Cut Handles, Tools and Files,

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Beats all machines. My new goods are guaranteed unrivalled in speed, durability, and ease of sharpening. A six-foot Cross-Cut Saw, with combined file and set and two Patent Handles, will be sent to any address upon receipt of Four Dollars. The universal Pat. sheathed Pruning and Hand Saw, inclosed in brass-edged sheath, mailed on receipt of One Dollar. A Buck Saw blade will be inclosed with the Cross-Cut for fifty cents additional. By using my patent file a Cross-Cut may be sharpened at a cost of five cents, and a Buck Saw for five cents. Send for illustrated price list. I make a liberal discount to honest dealers, and will protect them.

I have obtained decree, with costs and damages, against all parties who imitate my **M** teeth which cut with the outside of the **M** only. The two points of each tooth are set upon one side and the next two points on the other side, equivalent to front cut of ordinary hand-saw tooth, both ways, one point alternate decreases cutting one-half, as do all imitations (which are still held liable by the United States Court), and now Company will now collect of dealers and users, as well as manufacturers, for infringements. An Illustrated Catalogue furnished free on application.

For One Dollar, a Pruning Saw, complete, with brass edge sheath, or a Buck Saw blade, will be mailed. Agents wanted, to whom special terms will be made, and who can do well. This Company also manufactures the **Noon-Day Stove Polish,** so rapidly coming into favor.